VOL. XLIII
No. 1

APRIL, 1913.

Foreign, $3.60.
Canada, $3.25.
Single Copies, 30 Cents in U. S.

AMERICAN VETERINARY REVIEW

EDITED BY

Prof. A. LIAUTARD, M.D., V.M.,

Member Central Society of Veterinary Medicine (Paris). Honorary Fellow Royal College Veterinary Surgeons (England). Foreign Corresponding Member Academy of Medicine, Bruxelles (Belgique).

AND

Prof. ROBERT W. ELLIS, D.V.S.

WITH THE COLLABORATION OF

Prof. W. J. COATES, M.D., D.V.S., New York-American Veterinary College.
OLAF SCHWARZKOPF, Veterinarian, 3d Cavalry, U. S. Army, Fort Sam Houston, Texas.
Prof. W. L. WILLIAMS, V.S., New York State Veterinary College, Ithaca, N. Y.
Prof. S. STEWART, Kansas City Veterinary College, Kansas City, Mo.
M. H. MCKILLIP, M.D., V.S., McKillip Veterinary College, Chicago, Ill.
B. F. KAUPP, M.S., D.V.S., Research Pathologist, Chicago, Ill.
Prof. M. H. REYNOLDS, University of Minnesota, St. Anthony Park, Minn.
WM. H. DALRYMPLE, M.R.C.V.S., Veterinarian Louisiana Ag. Exp. Sta., Baton Rouge, La.
JOHN P. O'LEARY, V.M.D., Veterinary Inspector in Charge, B. A. I., Troy, N. Y.
A. T. KINSLEY, M.Sc., D.V.S., Path. Kansas City, Veterinary College Kansas City, Mo.
Prof. S. SISSON, S.B , V.S., Prof. Comp. Anat., Ohio State University, author of Sisson's Vet. Anat., etc., Columbus, O.
J. G. RUTHERFORD, V.S., H.A.R.C.V.S., Ex-Veterinary Director-General and Live Stock Commissioner, Ottawa, Canada.
J. F. DE VINE, D.V.S., Dept. Agr., Goshen, N.Y.
D. ARTHUR HUGHES, PH.D., D.V.M., Insp. Comm. Dept., U. S. Army, Chicago, Ill.
JOHN R. MOHLER, V.M.D., Pres. American Veterinary Medical Association, Washington, D. C.
L. A. MERILLAT, V. S., Chicago Veterinary College, Chicago, Ill.
D. E. SALMON, D.V.M., Ex-Director of the Veterinary School, Montevideo, Uruguay.
Prof. VERANUS A. MOORE, Director, New York State Veterinary College, Ithaca, N. Y.
RICHARD P. LYMAN, Dean Vet. Div. Mich. Agr. College, East Lansing, Mich.
C. J. MARSHALL, V.M.D., Sec'y A. V. M. A., Philadelphia, Pa.
A. D. MELVIN, M.D.C., Chief of B. A. I., Washington, D. C.
GEO. H. GLOVER, M.S., D.V.M., Director Div. Vet. Sci., Colo. Agr. Coll., Ft. Collins, Colo.
S. A. GRUENER, M.V.S., Veterinary Inspector, Kamchatka, Russia.

And several others.

CONTENTS.

	PAGE
Editorial.—European Chronicles	1
Volume Forty-three	11
Seven Reasons Why We Should Not Be Dismayed at Our Loss in the 62d Congress	13
Bronze Medal of Prof. S. Arloing	15
Original Articles.—Bacillus Bronchisepticus—Its Relation to Canine Distemper. N. S. Ferry, M.D.	16
Necessity for Milk and Meat Inspection. Louis A. Klein, D.V.M.	31
Diet Deficiency and Disease in Livestock. Fras. Evelyn Place, B.V.Sc., M.R.C.V.S.	46
Rheumatism. F. G. Whitehead, V.M.D.	61
Tetanus Treated Practically. D. D. LeFevre, D.V.M.	68
Follicular Mange. C. G. Rohrer, D.V.S.	74
Catheterization of the Bitch. Dr. Heinrich Jakob	80
Mistakes in Everyday Practice. Dr. F. E. Anderson	84
A Report on Equine Filariasis. Chas. F. Harrington, M.D.C.	87
Reports of Cases.—Jabot in a Horse. J. A. De Groot	90
Congenital Goitre of the Dog. Anton Loken	91
Some Surgical Cases Illustrating the Use of Cannabis as a General Anaesthetic—	
Case I—Roarer	92
Case II—Ovariotomy	93
Case III—Cryptorchid	93
Abstracts from Exchanges.—English Review. Prof. A. Liautard, M.D., V.M.	94
French Review. Prof. A. Liautard, M.D., V.M.	96
Belgian Review. Prof. A. Liautard, M.D., V.M.	98
German Review. John P. O'Leary, V.M.D.	101
Correspondence	105
Obituary.—Alfred M. Schalberg, D.V.M.	106
Army Veterinary Department	107
Bibliography.—Special Pathology and Therapeutics of the Diseases of Domestic Animals	109
Society Meetings.—Vet. Med. Assn. of New York City, February Meeting.	112
Vet. Med. Assn. of New York City, March Meeting	114
Notes on the Recent Meeting of the N. W. Ohio Vet. Med. Assn. at Toledo	117
Veterinary Association of Manitoba	118
York County Veterinary Medical Soc.	118
News and Items	120
Veterinary Medical Assn. Meetings	123
Publishers' Department	124

The AMERICAN VETERINARY REVIEW is issued on the 1st of each month. *Manuscript and copy for insertion should be received by the 12th of the preceding month* to insure insertion in the next month's number. *Volume commences* April and October.

Communications relating to publication, subscriptions, advertisements and remittances should be addressed to
AMERICAN VETERINARY REVIEW, 509 West 152d Street, New York, N. Y.

European Exchanges, books for review and personal letters should be addressed to
A. LIAUTARD, M.D., V.M., 14 Avenue de l'Opera, Paris, France

Entered at the Post Office at New York as Second-Class Matter

Oldest and Most Widely Circulated Veterinary Periodical in America

APR 4 1913 MEDICAL DIVISION

Second Volume **Completing Set** **Now Ready**

Special Pathology and Therapeutics of Domestic Animals

By Dr. **FRANCIS HUTYRA**
Professor of Infectious Diseases

and Dr. **JOSEPH MAREK**
Professor of Special Pathology and Therapy; both of the Royal Veterinary College of Budapest, Hungary

Authorized American Edition from the Third Revised and Enlarged German Edition

Translators of the first volume are **John R. Mohler,** V.M.D., Chief of Pathological Division United States Bureau of Animal Industry; **Adolph Eichhorn,** D. V. S., Senior Bacteriologist, Pathological Division, United States Bureau of Animal Industry, Washington, D. C.; **Dr. Paul Fischer,** State Veterinarian, Columbus, Ohio, and **H. J. Achard,** A. M., M. D., of the Editorial Staff of The American Journal of Clinical Medicine, Chicago.

Volume I treats on Infectious Diseases, Diseases of Blood and Blood Producing Organs, Diseases of the Spleen, Diseases of Metabolism, Diseases of the Urinary Organs, Diseases of the Circulatory Organs, and contains 1,133 large royal octavo pages, with 198 illustrations in the text and 10 special full-page colored plates.

Translators of Volume II are **Dr. Maximilian Herzog,** Professor of Pathology and Bacteriology, Chicago Veterinary College; **A. Leslie Sheather,** B. Sc., M. R. C. V. S., Demonstrator of Pathology and Bacteriology at the Royal Veterinary College London, and **G. Mayall,** M. R. C. V. S. Bolton, England.

Vol. II treats on Diseases of the Respiratory Organs, Diseases of the Digestive Organs (including all abdominal organs). Diseases of the Nervous System, Diseases of the Organs of Locomotion and Diseases of the Skin; contains over 1,018 pages, 163 illustrations in the text and five full-page plates.

SOLD IN SETS ONLY.

PRICE, PER SET, bound in half leather, $15.00
Will be sent, *express prepaid,* on receipt of price.

The attention of the veterinary profession is particularly called to the cosmopolitan character of this work. More than 1,000 advance orders for this work had been booked before it was published. Over ninety-six different veterinary journals and works of reference published in all civilized countries are quoted in the text, including English and American Books, Veterinary Journals, Experiment Station Bulletins, etc.

SAMPLE PAGES AND FULL DESCRIPTIVE CIRCULARS SENT ON APPLICATION

ALEXANDER EGER

Write for New Catalogue Just Out

VETERINARY PUBLISHER, CHICAGO

AMERICAN VETERINARY REVIEW.

APRIL, 1913.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, 15TH OF FEBRUARY, 1913.

SURGICAL RECORDS.—The importance of keeping records of cases by practitioners and of publishing those which present unusual interest by their peculiar nature or by their rarity, is probably more appreciated by some of our confrères than by others. Certainly it is an error on the part of those who are neglectful of keeping those records, as there is no doubt that it is by their perusal that the history of practical medicine is built up.

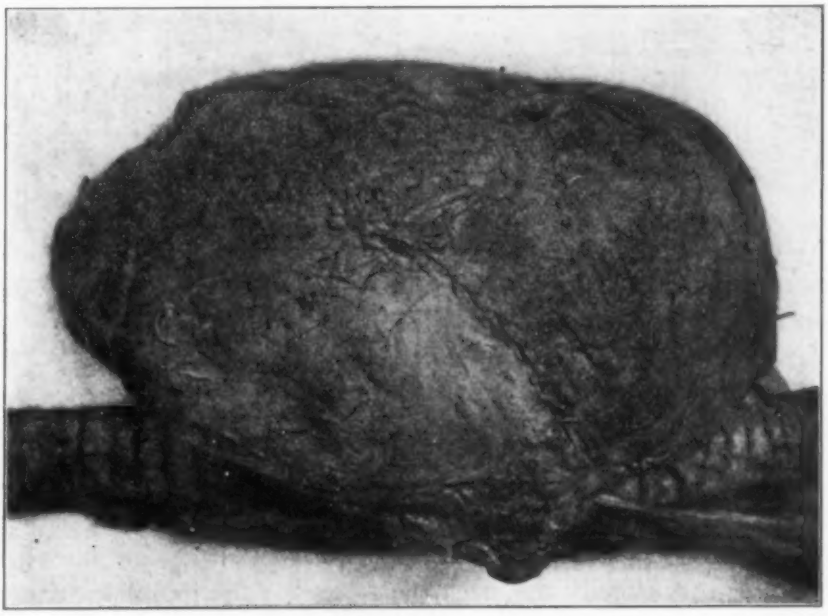
From a Belgian veterinarian, Prof. Hendrickx, of the School of Bruxelles, I have received an extract of several surgical observations which he has published in the *Annales de Belgique*, to one of which my attention has been principally drawn. It is the case of a *tracheal gaseous cyst in a heavy draught colt*, which is probably the first and only one of its kind in our veterinary literature; as the Professor writes, "He has looked in vain for a record of a similar case. Siedamgrotzky has described a colloid cyst immediately under the cricoid cartilage. Fleming has mentioned two polypi of the anterior face of the trachea. Human surgery is no richer, and not the slightest mention is made of gaseous tumor of tracheal origin."

The history of the case is as follows: At birth the colt had a swelling as big as the fist at the base of the neck. It was situated on the left side of the trachea, quite regularly round, without inflammatory manifestation and elastic to the touch. It had grown some, been seen by a practitioner who tapped it, when it came down, but returned some two hours later. Other punctures were followed with the same result. After a few days, as the tumor had enlarged, Prof. Hendrickx was called. The condition then was as follows: Respiration anxious, loud roaring, swelling as big as two fists towards the entrance of the chest; on the left side of the trachea; it is painless, has a consistency of gaseous elasticity, is tympanitic to percussion. There is no dysphagia. Puncture gives escape of gas and of some white liquid, which turns out to the milk. The puncture is followed by the disappearance of the tumor, but it is reformed after an hour. A diagnosis of gaseous cyst of embryonal origin, between the trachea and oesophagus, was made. Surgical interference with all its risks is the only chance offered for the little fellow. The owner gave his consent.

* * *

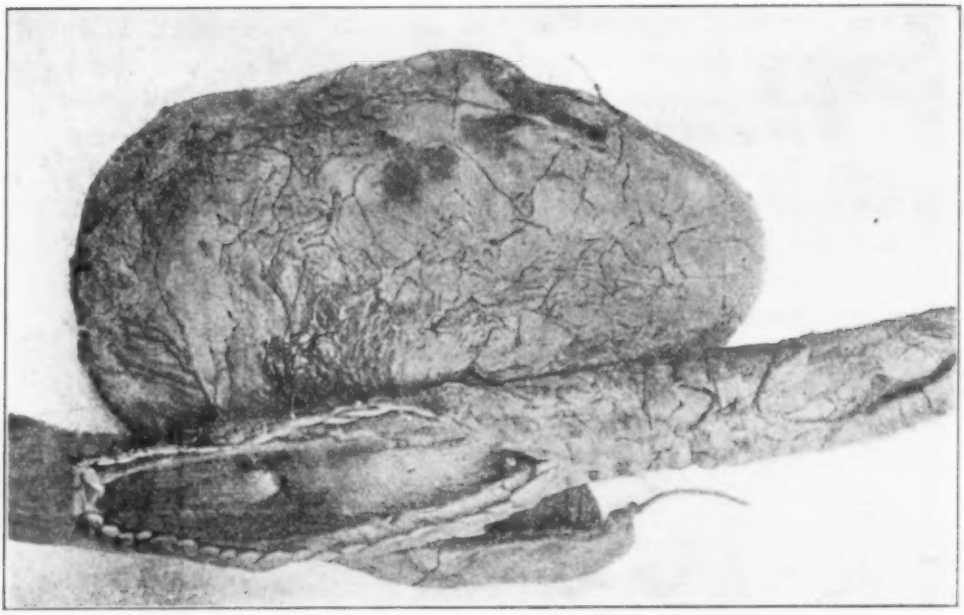
The animal was cast, an incision made along the inferior border of the mastoido-humeralis and with the fingers the peritracheal connective tissue lacerated. The blood vessels and nerves of the region were pushed aside and the trachea exposed showing the tumor attached to it by a peduncle as big as the finger. Carefully isolated from the connective tissue, a strong silk ligature was applied on the peduncle as close as possible to the trachea. The tumor was emptied by fine puncture and remained depressed, showing that indeed there was a direct communication with the trachea; communication which was closed by the ligature on the peduncle. A possible recovery was then entertained. But not realized as immediately below the insertion of the peduncle and involving five of the cartilaginous rings of the trachea, that canal was flattened sideways in such a manner that

the sides were separated only by a narrow slit through which the air had great difficulty to pass. This infirmity was incurable and its situation at the entrance of the chest did not allow of the possible utilization of the animal provided with a tracheotomy tube, so he was destroyed. The two plates that illustrate the record of Professor Hendrickx are reproduced and speak for themselves. In one the pouch is seen laying on the trachea and against the oesophagus. On the other the explanation of the formation of the anomaly is given. The trachea is open, showing an orifice between two rings, through which the mucous membrane of the trachea had evaginated, forming a *cul de sac* outside



The tumor filled with wadding and dried.

the trachea into which the air could enter easily. It is probable that the edges of the mucous slit acted as valves, opening in inspiration and closing in expiration, thus allowing the entrance of air and preventing its exit. Of course, as the animal grew the gaseous hypertension increased and the walls of the pouch giving



The trachea is slitted and shows the point where the opening existed.

away by degrees permitted the increased proportion. The communication between the oesophagus and the pouch could not be found, unless it had been accidental when the first puncture was made.

* * *

Tuberculous Bacilli in the Vaccinated Animals.—Among the many valuable contributions that are now and then presented to the Society of Comparative Pathology one has attracted principally the attention at one of the recent meetings. Presented by Prof. A. Calmette and Ch. Guerin, it related to the question of what becomes of the tuberculous bacilli in the organism of vaccinated animals.

All the antituberculous vaccins grant to bovines a resisting power to spontaneous or experimental infections, which lasts more or less and yet is manifest. This immunity or tolerating condition toward virulent bacilli of reinfection, which is also

observed in human beings after a mild attack of glandular tuberculosis for instance, is the result of the fact that vaccinated organisms, unable to get rid of those bacilli through the processes of intracellular digestion, have acquired the power to eliminate them slowly by the biliary or intestinal tracts.

Recent experiments have been made on the retention of virulent bacilli tested in lymphatic glands of bovines, vaccinated by intra-venous injections of bovine bacilli attenuated by cultures made on bovine glycerinated bile.

Seven vaccinated heifers received in veins, one month after the last vaccinal inoculation, 3 milligrams of virulent tuberculous bacilli. A control animal died the thirty-fourth day with acute granulitis. None of the vaccinated heifers had the slightest indisposition. Destroyed 1, 2, 3, 4, 8, 12, 18 months after the test, their bronchial glands, triturated entirely, were inoculated subcutaneously to 12 guinea pigs which were killed two months after. They all became tuberculous and none of the heifers presented macroscopic glandular lesion or any other.

One eighth heifer, vaccinated at the same time as the others, received a second time, by intravenous injection, eighteen months after the first test, 3 milligrams of virulent tuberculous bacilli, which killed controls in four or six weeks. This last heifer had not reacted to tuberculin before this second inoculation. She remained in perfect good health for three months after. It is probable that she kept her immunity on account of the presence of some bacilli in her lymphatic glands, as anterior experiments of vaccination by digestive tracts with weak doses of normal virulent bovine bacilli had shown that immunity disappears as soon as the bovines are no longer carriers of bacilli.

It seems as if it is so in man, and one can thus explain that a slight attack of tuberculous infection, especially if occurring in youth, is so frequently sufficient to preserve it against severe attacks of successive and frequent reinfections.

Two practical conclusions result from those: 1. Antituberculous vaccination must have for its object to insure, in the organism of the vaccinated individual, the persistency as long as

possible, of some bacilli, in such number and of such quality as being tolerated without giving rise to evolutive lesions.

2. In man, as in bovines, it is desirable that a mild natural infection, or one realized artificially with attenuated bacilli, should take place as soon after birth as possible, to confer to the organism the immunity or better a high tolerating power toward ulterior accidental infections and reinfections.

Paradoxical as it appears, the logical conclusion of the authors is that the only subjects, man or animal, which can escape serious tuberculous infections are "*the carriers of tuberculous virus.*"

* * *

RABIES AND ITS TREATMENT.—A most important question which has attracted the attention of all pathologists is again the subject of experiments by many, has received the stimulus of large prizes offered by scientific societies, medical as well as veterinary, has been the object of valuable communications and is still in its infancy as far as its treatment is concerned, at least as far as the curative. The preventive having years ago made its proofs.

For this reason the record of any case has its great value. Such is the following published in the *Presse Médicale,* which extracted it from *Il Policlino, Sez. practico,* of Cairo.

"A little girl of 13 years was bitten by a suspected dog which disappeared. Twelve days after antirabic treatment was started. After fourteen days there appeared a peculiar indisposition, with headache and light fever. These manifestations increased and three days later, twenty-nine days after the bite, the most positive symptoms of hydrophobia developed. Pharyngo-laryngeal spasms with each attempt to ingestion of liquid with absolute impossibility of deglutition, respiratory anxiety at the sight of water, etc. The cephalalgy was well marked, there was general hyperthesia and fever. The author is director of the Antirabic Institute of Cairo; he has followed some twenty cases of hydrophobia, and he had no hesitation in recognizing the case of the little girl as one of rabies with a fatal prognosis of death in four or six days."

Having prescribed chloral and no result being obtained, it was decided to try *Salvarsan.* An intravenous injection of 0. gr. 30 of 606 was given and followed by its ordinary reacting phenomenas. Eight hours after the injection, a slight improvement was observed. After twenty-four hours the patient was quiet, the hyperthesia had disappeared and water or milk could be taken with only a little difficulty.

Was the diagnostic made of rabies an error? Twenty-four hours later symptoms of paresia of the lower extremities appeared. In the space of a few days an ascending meningomyelitis developed, which was accompanied with very severe bulbar phenomenas in the respiration and circulation. There was paralysis of the facial and of the sixth pair of nerves and with these a very severe occipital cephalae. After five or six days improvement set in, became more marked by degrees, and recovery followed. Was the case one of true rabies transformed by the injection of 606? Did the drug act, like the antidiphtheric serum, in destroying the causal agent of rabies, but not arresting the course of the symptoms of the nervous intoxication already existing when the 606 was used? However, if it is to be regretted that cytologic or cultural examination had not been made, it is to be wished that other experiments shall be made with 606 in cases of confirmed rabies. Veterinarians may have more frequent opportunities to test it.

* * *

TENDINOUS GRAFTING.—Although this is but the record of an experiment, it has sufficient importance for borrowing it from the *Lyon Medical* where I found it related.

There was presented at a meeting of the Société des Sciences Médicales, the result of an experiment made of the grafting of the tendo-Achillis.

In a dog, the author made the resection of the tendo-Achillis, 2 centimeters in length and put in its place a graft of same

dimension taken from the tendo-Achillis of another dog, which had been taken off thirty-four days before and kept since that time in a sterilized solution of artificial serum, held in a frigorific apparatus at +1° temperature. The sutures of the graft had been made with fine silk and needles for vascular sawing. The animal was killed two months after and it was shown on the pathological specimen that the grafting had taken place in most excellent condition; the double line of stitches were still visible, but the continuity of the tendon was perfect. It was not a fibrous cicatrix spread between the two extremities of the divided tendon; the graft piece was perfectly recognized and had not been invaded by the granulations of the tendinous stumps; it was a true grafting with life in the grafted fragment.

This result is very interesting, as the graft was made with a preserved tissue. The fragment which had been fixed between the two ends of the resected tendon had had its cellular life suspended during thirty-four days and yet it united and lived.

This is encouraging, because grafting of tissues will not truly enter in the domain of surgical practice, says the *Lyon Médical,* until successes will be achieved with preserved grafts. Then a true material of various pieces of tissues could be kept ready in advance and ready for use when the opportune time will come.

*
* *

PATHOGENY OF TUBERCULOSIS.—Interesting questions which every pathologist is endeavoring to solve. Among them Professors Calmette and Guerin of the Pasteur of Lille hold a prominent position. They have recently presented to the Academie des Sciences a communication of the experimental researches that they have made and which show that, in the conditions of natural contagion, tuberculosis is first a general

infection of the lymphatic system, which precedes for some long time the apparition of the lesions.

These researches show that the law of Conheim, or of the lymphatic reactions, always claimed to support the facts which have a tendency to attribute to infection by inhalation, the preponderance in tuberculous contagion, can no longer intervene when natural infection is considered, such as it is realized in tuberculous cow sheds.

This natural infection gives rise first to a general disease of the lymphatic system, likely subsequently but not constantly, to localize itself, creates tubercles and develops lesions which are macroscopically visible.

It then seems that the pathogeny of tuberculosis presents the greatest analogy with that of glanders. And the intestinal origin of pulmonary glanders is no longer discussed.

* * *

TENTH INTERNATIONAL VETERINARY CONGRESS.—The organizing committee for the meeting which is to be held in London in 1914 held a meeting in October, 1912, when the following titles of subjects for discussion to be submitted to the consideration of the Permanent International Commission were agreed upon.

GENERAL MEETINGS.—Foot and Mouth Disease. Tuberculosis. *Section I.* Veterinary science in relation to public health. (1) Meat poisoning—its pathogenesis and the measures necessary to guard against it. (2) General principles to be observed in the inspection of the carcasses and organs of tuberculous animals with a view to determining their safety as articles of human food. (3) Public control of the production, distribution and sale of milk in the interest of human health. (4) Disinfection of wagons.

Section II. Pathology and Bacteriology. (1) Johne's disease. (2) Bovine Piroplasmosis (European) with special

reference to their etiology. (3) The relationship of the so-called type of tubercle bacilli. (4) Ultra-visible viruses. (5) Distemper, etiology and vaccination.

Section III. Epizootiology. (1) Anthrax. (2) Abortion. (3) Swine fever. (4) Glanders.

Section IV. Veterinary Medicine and Surgery. (1) Anesthesia, local and general. (2) Laminitis. (3) Roaring in horses. (4) The use of drugs in the treatment of diseases caused by nematode worms. (5) Sarcoptic mange in horses.

Section V. Tropical diseases. (1) The piroplasmosis (excluding red water). (2) Methods of dealing with ticks concerned in the transmission of disease. (3) Trypanosomiasis of animals.

* * *

DR. FRANK S. BILLINGS.—I have only recently learned through the columns of an earlier issue of the AMERICAN VETERINARY REVIEW of his death, which took place at Sharon, Mass., October 14, 1912, at the age of 68 years, hence this late obituary notice. Dr. Billings was once prominent in the profession, and shortly after his return from Germany where he had graduated he commenced a long series of articles on *Veterinary Education,* as, in his mind, it ought to be carried out in the United States. Nothing would please him but a national veterinary institute. Dr. Billings wrote also numerous articles for the REVIEW and for the *Turf, Field and Farm.* He published many on the etiology, nature and microbian origin of hog cholera. He also wrote a large volume on the "Relation of Animal Diseases to the Public Health." At one time shortly after his return to America he endeavored to be connected with the faculty of the American Veterinary College, but for some reason or another his relations with that institution lasted only a very short time. Dr. Billings was a man of vast knowledge, but his contrary disposition of mind, his great desire of controversy, and possibly a

very nervous and irritable character, prevented him reaching in the profession the position to which his education and facilities seem to give him a claim. Member of the U. S. V. M. Association, from which he resigned years ago, and I believe of the Massachusetts Veterinary Medical Association. He was a man with a kind heart, and to those who have known him "he was an old friend."

* * *

SUNDRY ACKNOWLEDGMENTS.—Veterinary notes of Parke, Davis & Co.—No. 1 of Vol. 6, *The Country Review* (Baton Rouge), containing a series of articles on the Louisiana sheep industry. Among the editorial remarks made in one of the numbers it is said: "In addition to the valuable services that Dr. Dalrymple is rendering to the people by his years of splendid work at the Louisiana State University, he finds the time from his busy duties to do much elsè in various other capacities to advance the welfare of the agriculturist, and, in fact, of all the people." This is an acknowledgment that veterinarians who may read Dr. Dalrymple's communications will warmly endorse.

Agricultural Journal of the Union of South Africa (December number).

Louisiana Bulletin No. 136. Experiments on "Carrion Feeders as Disseminators of Anthrax," by Harry Norris.

Bureau of Animal Industry—Bulletin 158. *The Roundworms of Domestic Swine,* with special reference to two species parasitic in the stomach, by Winthrop D. Foster, with 28 illustrations.

A. L.

VOLUME FORTY-THREE.

In presenting this, the first number of volume forty-three, to our readers, we wish to thank them for their loyal support

and hearty co-operation during the past year. To be sure we have presented them with two volumes since this time last year; that became a necessity some years ago because of the greater number of pages in each number over those of earlier years in the REVIEW's history; but somehow we always think of this volume, beginning with April, as the beginning of a new year. And it is but natural that we should, as it was the beginning of the REVIEW year for thirty years before we began to have two volumes a year. And, besides, it is the time of the year when all nature rejoices and begins anew. And so we rejoice and begin anew. Rejoice that the results of our efforts have measured up to the expectations and demands of an intelligent and exacting public, as evidenced by their loyal support and expressed appreciation. Begin anew to make volume forty-three better if possible than any previous one in the REVIEW's history. And it *is* possible with the continued support of the great American veterinary profession, to whom the AMERICAN VETERINARY REVIEW is a part of their daily life. To them the pages of the REVIEW are the fields, and as richly and as generously as they sow in those fields, so richly and so generously shall they reap the manyfold harvest of good things in return. Use its pages freely, then, for recording your experiences, while reading in them the experiences of others; and remember that the simplest case holds something of interest and value to a brother practitioner, and with that thought in mind, lay aside any reticence prompted by modesty and report it, and thereby be yourself an active factor in making this volume that opens with the spring, and whose first number comes to you fresh and green, and scented with the cowslip and primrose, the biggest and the fullest that has yet been produced. And that means a great deal, when you stop to consider that in the year just past we have published 110 original articles, 287 reports of cases, many of them (especially the European) with post-mortem findings, reported 63 society meetings, reviewed 15 new works on veterinary and allied subjects and published 83 illustrations; to say nothing of the 15 pages of editorials each month, corre-

spondence and other departments dealing with special subjects of importance to the profession. But as we have said we are determined, with your continued co-operation and generous support, to make it still better. Whose experience will appear in the next number?

SEVEN REASONS WHY WE SHOULD NOT BE DISMAYED AT OUR LOSS IN THE 62D CONGRESS.

In the addendum to our editorial on the "PRESENT STATUS OF ARMY VETERINARY BILL" in our March number, we referred to the courageous manner in which Chairman Hoskins emerged from the skirmish after defeat; and we are taking the liberty of publishing here (without Dr. Hoskins' knowledge or consent), a personal letter, which seems to express such a keen appreciation of the situation, by that gentleman, and to show so clearly what has been accomplished in the last campaign, and therefore pointing out just where we are to begin with the next one, that it seems as though pages of information and enlightenment are expressed in those few words, which are therefore of such value to those who are again to wage the battle in the sixty-third Congress, that Dr. Hoskins *cannot* object to their publication; and the undismayed spirit which our leader in the cause displays should rally his forces around him as nothing else could.

"*Dear Doctor Ellis*—I have your letter and note your regrets at our efforts to win recognition for our Army veterinarians.

"Let us not be dismayed at our loss in this Congress. Let us rather recount what we have gained—first—that in our popular appeal to our representatives in the 392 Congressional districts, not a single one felt it his duty to oppose or defeat this bill when it was on the unanimous consent calendar.

"2d. That it won its way through the House Military Committee committed to retrenchment in Army expenses, though

it would have increased the cost of the service more than thirty-five thousand dollars per year.

"3d. Lest we forget, more than fifty Senators were outspoken in their support of this measure and ready to vote for it at any time.

"4th. That our defeat was brought about by the War Department lobby that has killed every measure we have ever advocated—will show forth in the final analysis.

"5th. That our battle for recognition was an open, frank one, and that we emerge in our defeat without having laid one unworthy obligation on the profession nor of having resorted to any line of action that was not open and honorable.

"6th. We should be undaunted by our temporary defeat, for no just cause is ever lost—ours is just and righteous and must prevail.

"7th. Let us with renewed vigor and greater determination press our cause, for just so long as the present condition prevails, we are still classed as an unscientific body of men and looked upon as mere civilians and of the teamster class by those who covertly oppose and defeat our efforts.

"For these reasons let us with greater determination lift our profession above the unjust criticism or the unfair reflections of any department of our Federal government—with every appreciation of your kindly expression, I am,

"Fraternally yours,

(Signed) "W. Horace Hoskins."

Surely the words of the man who is to lead us again into battle for the recognition of our profession in the United States Army, are sufficiently convincing and sufficiently encouraging to make the American veterinary profession as a unit tighten its armor and stand ready to "fire" at command. We stated in our March editorial that "should success crown our efforts, it would be the result of one of the fairest, hardest fought, non-partisan battles for a cause that had ever been waged in this or any other country." And the same applies now that we have

lost (or as our undaunted leader prefers to express it, sustained temporary defeat), so we can hold up our heads, throw out our chests and stand ready for the next " charge " with nothing to regret. Not even time lost, but taking a lesson from the chairman of the committee on legislation recount what we have gained.

BRONZE MEDAL OF PROF. S. ARLOING.—The accompanying photo-engravings show the two sides of a beautiful bronze medal (actual size), recently received from the Arloing Monument Committee, Lyons, France. This medal is such a work of art, and is so significant in the world's history of veterinary medicine, that in acknowledging its receipt, we have reproduced both sides of it for our readers. " As a learned scientist, as a teacher, as a veterinarian, Arloing has rendered services which will never be forgotten. General and comparative medicine owe him much " (Prof. Liautard in the Sept., 1911, REVIEW). Professor Arloing's visit to New York shortly before his death, is remembered with much pleasure by Dean Coates of the New York-American Veterinary College, whose privilege it was to conduct the distinguished scientist around the great city.

ORIGINAL ARTICLES.

BACILLUS BRONCHISEPTICUS—ITS RELATION TO CANINE DISTEMPER.*

By N. S. Ferry, M.D., Detroit, Mich.

In January, 1911, Dr. J. P. M'Gowan, who was working on grants from the Carnegie Trust and Moray Research Fund in the laboratory of Dr. James Ritchie at the Royal College of Physicians, Edinburgh, published in the *Journal of Pathology and Bacteriology,* London (3), the results of some observations on a laboratory epidemic especially among dogs and cats, in which the animals presented the symptoms of the disease called "distemper." In the April number of the same Journal, as a continuation of his first article, he described the organism which was found constantly in all of the affected animals. Dr. M'Gowan, however, evidently was not aware of the fact that several months previous, in the American Veterinary Review (1), I had published my bacterial findings in canine distemper and had described in detail the same organism. It is also very interesting that Dr. John C. Torrey, Director of the Department of Experimental Pathology of the Cornell Medical School, New York City, who, in collaboration with Mr. Rahe, was working along practically the same lines at the same time, independently isolated the identical organism. In my second article, published in June, 1911 (2), in the *Journal of Infectious Diseases,* my work was described in full, and at the time the name *Bacillus bronchicanis* was given to the organism. M'Gowan isolated his organism from the dog, cat, rabbit, guinea-pig, ferret, monkey, goat and also man in one case. Torrey and myself, however,

* Presented to the Forty-ninth Annual Meeting of the American Veterinary Medical Association, at Indianapolis, August, 1912. From the Research Department of Parke, Davis & Co., Detroit, Mich.

limiting our work to the dog, went much more extensively into the subject than did M'Gowan. Torrey, although he did his work about the same time as M'Gowan, did not read his paper until April, 1912, at the American Association of Pathologists and Bacteriologists, owing to the fact that my first article was published before he had completed his experiments. He, therefore, continued his work which, as yet, has not been published.

During the first part of this year, while working on an epizootic among guinea-pigs, rabbits and monkeys, I was able not only to isolate the same microorganism from the animals, but showed that the infection in guinea-pigs was probably general throughout the United States and was perhaps an important contributory cause of the scarcity of guinea-pigs in this country. In the last April number of the AMERICAN VETERINARY REVIEW (6) this work was reported, and at that time the name of the organism was changed from *Bacillus bronchicanis* to *Bacillus bronchisepticus,* as it was, beyond a doubt, the cause of an infectious disease among many animals. The full report of this work, as well as other work of mine along this line, was published in the July issue of *The Veterinary Journal* of London (7) of this year.

M'Gowan, while he did some work on the dog, made his most valuable contribution to the subject with his work on other animals, especially cats (4). He was the first to show that the organism, which I had previously proved to be the cause of distemper in dogs, gave rise also to pathological lesions in other animals.

Torrey's work was valuable from the fact that he went so exhaustively into his experimentation on dogs. As his work corroborated mine so fully, a review of his conclusions, which are also found in my article in the *Veterinary Journal* of London, will be given. He says: "The only microorganism regularly found was *Bacillus bronchicanis,* and its regular occurrence, its presence in overwhelming numbers in the respiratory tract in the great majority of cases, its appearance in the very earliest stages of the disease, and its progressive invasion and increase

in numbers as the symptoms increased in severity leads one to conclude, from the bacteriological findings alone, that this bacillus is an important factor in the causation of the disease." "The strains of this organism, which were isolated from sixty-five cases, reveal an absolute uniformity in cultural reactions with the exception of one test. A few strains, 13 per cent., were encountered, which caused a marked reduction of nitrates to nitrites, but with 87 per cent. there was no reducing action. All these strains are agglutinated to about the same degree by a serum immune to a single strain. This bacillus, accordingly, is not split up into sub-varieties or groups as is the *Bacillus dysentericus* or the *Bacillus coli;* but all strains comprised within a single species. This bacillus elaborates no exotoxin." He also says: "This bacillus finds its most favorable soil on the mucous membranes of the respiratory tract, for it invades, as a rule, the organs of the animal to only a slight extent. Of sixty-five positive cases it was present in the liver in 30 per cent., in the spleen in 20 per cent., in the kidney in 16 per cent., and in the blood in only 6 per cent." "By experimental inoculation with the *Bacillus bronchicanis* we have been able to induce typical attacks of distemper, with typical incubation period and symptoms complex, and from such experimental infections the *Bacillus bronchicanis* was recovered readily in pure cultures and in great numbers." Dr. Torrey produced the disease experimentally by blowing the organism or infected dust into the nasal passages with powder blowers. His conclusions were as follows:

"1. Dogs which are immune to natural distemper show no symptoms when exposed to experimental infection with *Bacillus bronchicanis.*

"2. Dogs actively immunized to *Bacillus bronchicanis* are immune to natural distemper.

"3. Dogs recovering from attacks of experimental distemper induced by this bacillus are protected on exposure to natural distemper.

"4. The *Bacillus bronchicanis* is the only cultivatable microorganism present with uniformity and in great numbers in the tissues and organs of distemper cases.

"5. Typical distemper may be induced in susceptible dogs by infection with pure cultures of the *Bacillus bronchicanis* under conditions simulating natural modes of transfer, and the bacillus may be recovered in pure culture from the organs of such experimental cases."

For the benefit of those who have not had access to all of these reports, and also those who still hold to the old belief of a filterable virus as the cause of distemper, the data of M'Gowan, Torrey and myself will be reviewed briefly showing the work upon which we based our conclusions, namely, that the cause of distemper was due to a bacillus which could be grown on the ordinary culture media. The work of Carre, which was merely a short report of two or three pages, is extensively quoted by authors on veterinary subjects, and yet I have never been able to find in the literature where it has ever been corroborated under conditions which eliminated infection from outside sources. On the other hand, the bacillus in question has been isolated repeatedly by several investigators and the experimental work has been corroborated by all who have undertaken to repeat it.

In reviewing the work of M'Gowan, Torrey and myself the subject, for convenience, will be taken up under the following heads:

Primary Infection,
Agglutination Experiments,
Protective and Curative Inoculations,
Experimental Distemper.

Primary Infection.—From 29 laboratory dogs with symptoms of distemper M'Gowan found the organism in 27 cases. From 67 laboratory cats with symptoms he found the organism in 65 cases. From 6 rabbits he found it in 6 cases. From 3 guinea-pigs he found it in 3 cases.

M'Gowan says, speaking more especially with regard to dogs, "The disease I have been investigating, 'distemper,' is one limited primarily to the mucous membrane of the nose. From this situation it may spread secondarily to the frontal sinuses and

the middle ear, from which it may go to the brain." "The disease may further spread to the conjunctiva, to the trachea, to the lungs, causing, however, in the last case, pneumonia and sometimes empyema." He also says, "Speaking for the disease I have been investigating, it is not of the nature of a septicemia." M'Gowan was never able to isolate the organism from the blood of any of his animals (5).

Torrey, on the other hand, working with dogs alone, found the organism in 65 cases out of 80. He says, "We have had about 80 cases in all, comprising all the stages of the disease from the incubation period to the postmortem, mild cases as well as severe." Torrey's cultural work was more thorough than M'Gowan's, for he made a routine examination of all the organs of every animal. In making the cultures, the animals were as a rule exsanguinated from the carotid, the blood and pericardial fluid cultured and small, but approximately equal portions of the apex and basal regions of the lung, the liver, the spleen and kidney and sometimes of the brain were emulsified and plated, the whole carried out according to Bail's method. Plate cultures were also made from the exudate of the eye, nose and trachea. Of 55 positive cases Torrey found the organism in the liver in 32 per cent., in the spleen in 20 per cent., in the kidney in 16 per cent., in the blood in only 6 per cent. Torrey observes that as a rule the bacillus finds a more favorable locality for its primary growth in the trachea rather than in the nose, which also corroborates my work. "From this point," he says, "the virus gradually extends into the larger trachea and finally into the bronchioles, when it generally incites a more or less extensive broncho-pneumonia." This also corroborates my work, for it was found that when the *Bacillus bronchisepticus* was isolated in pure culture from a diseased lung the condition was, as a rule, that of broncho-pneumonia. I have seen but a few cases of lobar or massive pneumonia from which the *Bacillus bronchisepticus* was isoluted in pure culture.

Up to the time of the publication of my second article I had isolated the bacillus from 97 dogs at autopsy. In 68 cases it was

isolated in pure culture, either from the respiratory tract or blood. From the first 68 cases of distemper (other than experimental cases) I found the organism in 12 out of 42 blood cultures (28.5 per cent). Torrey found it in 6 per cent. and M'Gowan not at all. I attribute this apparent discrepancy possibly to variances in method. If the blood was at all fluid in the heart it was my custom to take from one to four cubic centimeters, or if not fluid, as much of the clot as possible, and plant in 50 c.c. of bouillon. It is a matter of experience that the greatest number of positive blood cultures are obtained when large quantities of blood are planted in correspondingly larger amounts of fluid culture media. In attempting to obtain cultures from the internal organs, Torrey macerated small portions of the tissues from which he made plate cultures, while I planted a large piece of each organ in a tube of bouillon. While the former method has advantages which are obvious, yet I believe the latter method will give a higher percentage of positive findings. Experience with this organism has shown that plating directly from tissues of the animal does not always produce positive results.

My findings with other animals, as given in the *Veterinary Journal* of London, are as follows:

" Number of animals posted	93
" Of these there are:	
" Guinea pigs	75
" Rabbits	12
" Monkeys	6
" *Bacillus bronchisepticus* isolated from 86 animals	92.5%
" From trachea, 81 animals	94.2%
" From lung, 46 animals	53.5%
" From liver, 34 animals	39.5%
" From blood, 29 animals	33.7%
" Pure cultures from trachea, 74 animals	86%

" The points concerning the disease in these laboratory animals, which should be emphasized, are as follows:

" 1. None of the guinea-pigs or monkeys showed any signs of an infection of the nasal cavity or the eyes.

"2. The infection was probably primarily in the larynx and trachea, as the organism was found in pure culture in those situations in nearly every case.

"3. The infection in these three species of animals was that of septicemia in the majority of cases, as the bacillus was isolated in pure culture in many of the cases from the heart's blood and abdominal organs.

"4. All the guinea-pigs and nearly all other animals suffered in the earliest stages of the disease with a profuse diarrhea.

"5. If the case was taken early enough, the *Bacillus bronchisepticus* could be isolated without much difficulty from the intestinal discharges, and often in nearly pure culture from the mucus of the small intestines, where congestion was most in evidence.

"6. Some of the rabbits showed an infection of the nasal cavity, and a few of the eyes, but many died with only an infection of the trachea and bronchi, and in nearly every rabbit the bacillus could be isolated from the blood.

"7. None of the monkeys showed an infection of the nasal cavity or eye, but did give evidence of an infection of the trachea and bronchi, and a septicemia, as the organism was found in pure culture in the trachea, bronchi and blood. One of these monkeys had a typical bronchial cough."

One of the most complete proofs of the relation of *Bacillus bronchisepticus* to canine distemper may be found in the accompanying chart. This chart represents an epizootic which took place among a number of pups I was raising for experimental purposes. A dog infected with a typical case of distemper accidentally came in contact with the keeper of these pups, with the result that nearly all became infected. The pups were watched, and from the time the first sign of the disease made its appearance until death, every abnormal symptom was recorded. This chart was of value, for it threw more light on the bacteriology and symptomatology of the disease than I could have gathered from any other source of information. A glance at the chart will show the points which should be emphasized. From the dogs

105	106	107	108	109	110	111	116	117	118	119	120	114	112	113	115
1 Convul.															
2															
3 Cough	1 Convul. Cough	Cough													
4	2														
5	3				Convul.										
6 Very ill	4 Cough increased	Cough increased	1 Cough	Cough	Cough										
7	5	Diarrhea Skin erupt	2 Convul.	Convul.		1 Cough	Cough	Cough		Cough	Cough	Cough	Cough	Cough	Cough
8 Killed	6		3	Diarrhea	Diarrhea	2 Diarrhea	Diarrhea		Cough						
	7 Killed	Killed	4 Killed	Nose (serous)		3		Diarrhea	Diarrhea	Diarrhea		Diarrhea	Diarrhea		
			5	Killed	Nose (serous)	4 Nose (serous)	Nose (serous)	Nose (serous)	Nose (serous)		Diarrhea	Nose (serous)		Diarrhea	
			6			5 Eyes (serous)		Eyes (serous)	Nose (purulent) Eyes (serous)	Nose (serous)	Nose (serous)		Nose (serous)		Nose (serous)
			7		Eyes (serous)	6	Eyes (serous)			Eyes (serous)	Nose (purulent)	Eyes (serous)	Nose (purulent)		Eyes (serous)
			8			7 Nose (purulent)	Nose & Eyes (purulent)			Nose & Eyes (purulent)	Eyes (serous)	Nose & Eyes (purulent)			
			9		Nose & Eyes (purulent)	8		Nose & Eyes (purulent)	Skin erupt.	Skin erupt.	Eyes (purulent)				
			10		Died	9 Eyes (purulent) Skin erupt.									
						21 Died	16 Died	17 Died	Recovered	Recovered	Recovered	Recovered	Recovered	Recovered	Recover
B. bronchi.	B. bronchi.	B. bronchi.	B. bronchi.	B. bronchi.	B. bronchi. Staph. and others	B. bronchi. Staph.	B. bronchi. Staph.	B. bronchi. Staph. and others	B. bronchi.	B. bronchi.	B. bronchi.	B. bronchi.	Sterile	Sterile	Steril
Cough, Convulsion, and Diarrhea				Nose	Eyes	Secondaries						Vaccinated			

killed early in the disease the *Bacillus bronchisepticus* was isolated from the trachea in pure culture. From those killed later and others which were allowed to die natural deaths, secondary organisms were isolated, together with the primary organism, the *Bacillus bronchisepticus*. From those which recovered from the disease and were not vaccinated the bacillus was isolated in pure culture from the trachea, while those which were vaccinated, with one exception, did not show the organism.

The first symptom to appear was either a cough or convulsion, usually the convulsion. This was followed shortly by diarrhea. Then came the serous discharge from the nose followed by that from the eye. Then appeared the purulent discharge from the nose, closely followed by the purulent discharge from the eyes. As soon as the purulent discharge from the nose and eyes was noticed the trachea was found to contain the secondary organisms as well as the primary. Dog 105 was the first to become infected, while 106 and 107 soon followed. The remainder of the dogs were probably infected from 105, as they were all running together in a large room. The period of incubation accordingly for the epizootic was five days. I have found this to be about the average period of incubation, whether dogs were experimentally infected or had accidentally contracted the disease.

Agglutination Experiments.—The agglutination work was carried on extensively by all three of the experimentors, and all came to practically the same conclusions; namely, that the reaction was specific for the bacillus, that serum from dogs spontaneously infected gave positive reactions, although not in as high dilutions as those experimentally infected, or those artificially immunized against the bacillus, and that the serum from healthy dogs which had not previously suffered with distemper did not agglutinate the organism.

Torrey says that, "Dogs which are sacrificed during the earlier stages of the disease and those which have succumbed or seem about to die from the infection have not, as a rule, developed any agglutinins for this bacillus. On the other hand, animals which are holding their own, are recovering or have recovered

fully carry agglutinins in their blood which clump the *Bacillus bronchicanis* in dilutions of from 1 in 25 to 1 in 500." "This tardy development of agglutinins," he thought, "may be due to the slight properties of the bacillus."

M'Gowan says: 1. "When an animal is immunized with a certain strain, a fairly high agglutinative power is developed in its serum against that strain. This agglutinative power never was higher in the cases examined than 1 in 120 and rarely above 1 in 60."

2. "In such an animal the serum generally has marked agglutinative properties for strains of the organism other than that with which the animal was immunized." "Here, although the organisms were of very different strains from that used for immunization, some five cats and some four dogs, the agglutination is almost as marked as with the organism used for immunization."

3. "Animals in which there is no evidence of distemper; *e. g.*, healthy animals brought into the laboratory and killed at once show no agglutinating properties in their serum against the organism."

4. "Where an animal is suffering from distemper, and when the organism is found in it during life or postmortem, the serum of that animal may or may not agglutinate a strain of the organism."

In my agglutination experiments it was found that the serum from all dogs suffering with the disease gave an agglutination ranging from 1 in 40 to 1 in 800, while the serum from those artificially immunized against the organism gave an agglutination ranging from 1 in 800 to 1 in 4,000. The test of one serum against several different strains ranged from 1 in 600 to 1 in 6,000. Here again the difference in method may have had something to do with the great range between M'Gowan's results and mine. In all my experiments the following procedure, which was found after many trials to give the best results, was adhered to. The emulsion for the agglutination tests was made from 18-hour agar cultures, taken off in physiologic salt solution, to which was

added enough formaldehyde to make a 1 per cent. solution. This emulsion was allowed to stand for five hours at room temperature, which time was sufficient to kill all organisms. The tubes were placed in the incubator and were examined at the end of 24 hours. Serum from dogs which had never suffered with the disease gave negative results.

Protective and Curative Inoculations.—As this paper was intended to show the relation of the *Bacillus bronchisepticus* to dog distemper, nothing will be said at this time concerning the vaccines made from the organism, except in so far as it aids in proving the specific nature of the bacillus. Relative to vaccines, M'Gowan carried on but few experiments, while Torrey makes no mention of his work along this line, except in his conclusion. He says, "Dogs actively immunized to *Bacillus bronchicanis* are immune to natural distemper." My work with vaccines made with this organism dates back to about June, 1909, when experiments were undertaken to immunize and treat dogs with killed and live cultures of the bacillus. A large number of experiments have been carried on from that time to the present with vaccines of different strengths, with one or more inoculations at varying intervals, and it is safe to say that the majority of pups can be protected, provided they are injected a certain time before exposure. It has been found that for practical purposes, three injections, with a few days interval between injections, give the best protection. Lately, experiments have been carried on with pups only a few days old, while they are still nursing their mother, and so far no ill effects from the injections have been seen, while it would appear the large majority of the pups are protected. As these experiments are not finished it is impossible to draw any conclusions of value. If the results are favorable the benefits of this protection cannot be overestimated. Experiments conducted the past two or three years have shown that about 60 to 70 per cent. of distemper dogs may be saved providing the vaccine is given early in the disease, and the cases are as carefully handled as they would be without the treatment. I believe also that better results are obtained with a vaccine made

from several strains of the organism than from one. As I have never been able to produce the disease by subcutaneous inoculation, it has been a safe procedure in my hands, and with more lasting results, to immunize with suspensions of live organisms. For practical purposes, however, that method is out of the question.

Experimental Distemper.—It is an interesting, but an explainable coincidence, that all investigators who have championed various microorganisms as the cause of canine distemper have claimed to have produced typical distemper with their respective viruses. From the experience of M'Gowan, Torrey and myself it would seem that infections from outside sources play an important part in these results. Enough stress was not laid by others on protecting the experimental animals from outside contamination. This great source of error was recognized by the last-named investigators, who used the utmost precautions with all their experimental inoculations, and it was only after their work was thoroughly checked up that they were willing to concede the bacillus was the etiological factor in this disease. I will quote from both M'Gowan and Torrey on this subject.

Torrey says, " Most of the investigators who have isolated various microorganisms from distemper dogs have claimed to have produced the same disease with the bacillus which they have considered the etiological factor. It would seem, however, that with a few exceptions the importance of excluding contact infection, direct or indirect, in their experimental animals has not been given due consideration. In our experiments the dogs used for experimental infection have been kept in a different part of the building and far removed from all possible contact with cases of spontaneous distemper. They have been cared for by special attendant who has kept away from all other dogs in the laboratory. These dogs, of which the history was known in most instances, were placed in sterilized cages and kept for at least 14 and generally over 20 days before any experimental infection was attempted, in order to eliminate any possible outside infection. After inoculation they were placed in a room never before

used for dogs, in new cages and cared for by a special attendant. It has been claimed by Carre that this disease may be experimentally induced in dogs by a filterable virus. Under the conditions, however, just outlined I obtained uniformly negative results with filtrates from scrapings of the nasal and bronchial passages of distemper dogs and filtered blood, although in earlier and less carefully controlled experiments some apparently positive infections occurred. In these cases, however, the possibility of accidental transmission of the virus from distemper cases could not be eliminated. Our experiments certainly indicate that canine distemper is not due to a filterable virus."

M'Gowan says, "Not one of those who have stated that they have found the organism of distemper seems to have appreciated the infectiousness of the disease, for there is no mention in their papers of particular or indeed any care having been exercised to ensure complete isolation. Neglect to mention such precautions in such a case cannot be overlooked." "The lack of such precautions would explain also the regularity with which the various observers have produced the disease in animals by subcutaneous inoculation of their organism."

I will quote from my second paper showing also the precautions that we felt necessary to take in order to prove conclusively that we were dealing with the causative organism.

"In order to carry inoculation experiments to a successful termination and be sure that the dogs were not accidentally infected, three large rooms in buildings isolated from each other were used, each room being in charge of a different attendant. The pups used were taken directly from their mothers as soon as weaned. After making sure that the pups were in a healthy condition, they were at once given a bath, and then thoroughly soaked in a germicidal solution and placed in the incubation room. Here they were allowed to remain from three to six weeks under strict observation, in the charge of a man who kept away from other dogs. From the incubation room the pups were placed in another room, where they remained under observation at least three weeks longer before experiments were made. The

floors and walls of these rooms were of cement, making it possible to wash and spray thoroughly with a germicidal solution as often as deemed necessary. The rooms were thoroughly disinfected and cleaned before the reception of each lot of pups and after each experiment. They were under lock and key and no one was allowed to enter except the attendant, laboratory assistants and myself. Following these precautions and with careful feeding and handling, one could be reasonably sure that all abnormal symptoms following inoculations were due directly and solely to the treatment. In a third room, in a building far removed from the first two, were kept all the convalescing as well as all sick dogs and others under observation and treatment. All autopsies were held in the laboratory, where cultures could be taken conveniently without fear of contamination."

In speaking of his experimental work Torrey says, "It has been our aim in these infection experiments to approximate as closely as was feasible natural modes of transfer of the disease. Without doubt the port of entry is the respiratory tract and the vehicle of transfer the discharges from the nose or throat either in a moist or dry state." "Scrapings from cultures of this bacillus were dried, partially pulverized and mixed with dry sterile dust. By means of insect powder blowers this infected dust was projected into the nasal passages and mouth of the experimental animal. After an incubation period of 3 to 13 days definite symptoms of the disease developed in 6 out of 7 of these animals, the attacks ranging as is the case in natural conditions from mild to very severe and fatal issues." "The symptoms developed included rhinitis and bronchitis with persistent cough, typical broncho-pneumonia, vomiting, bloody diarrhea, conjunctivitis, and in three instances the appearance of a typical pustular eruption of the skin."

In my second article was reported in detail the work carried on by me in order to attempt to produce the disease experimentally. Between 40 and 50 dogs were used and in 28 of these the disease was produced, ranging from the mild type to the very severe. In several instances, following typical symptoms of the

disease, death was the ultimate outcome. Being led to believe from my previous autopsy findings that the primary seat of the disease was in the larynx or trachea, the organisms were introduced experimentally into the trachea by means of hypodermatic syringes, the medium of transfer being either bouillion or physiologic salt solution. In this way there was practically no chance of secondary or other pathogenic organisms accompanying the specific bacillus to its seat of possible infection. Any infection, accordingly, resulting in this region, from which this organism could later be isolated in pure culture, would be caused by the organism in question. Symptoms, therefore, accompanying and following this infection would, *a priori,* be the result of the infectious process set up by the organism. While this procedure has its advantages, the method used by Torrey, which similates natural modes of introduction of the organism, was just as reliable and possibly of more value.

In recapitulating I will state that the *Bacillus bronchisepticus* was found by three investigators independently in different parts of the world to be the cause of canine distemper. The organism was isolated from the large majority of cases in pure culture, and was found to agglutinate serum from dogs suffering with distemper as well as those immunized and experimentally infected with the organism, while all normal controls were negative. Suspensions of both live and killed organisms were found to protect dogs from natural distemper, and dogs experimentally infected were found also to be immune to natural distemper. Typical distemper was induced, and the organism again isolated and grown in pure culture under conditions excluding outside source of infection, thus fulfilling Koch's dictums to the letter, and disproving thereby any theory which may previously have been held that the disease is due to a filterable virus, or a virus which is not able to be grown on the ordinary culture media.

LITERATURE.

1. Ferry, American Veterinary Review, 1910, Vol. xxxvii, No. 4.
2. Ferry, *Journal of Infectious Diseases,* 1911, Vol. viii, No. 4.
3. M'Gowan, *Journal of Pathology and Bacteriology,* 1911, Vol. xv.
4. M'Gowan, *Journal of Pathology and Bacteriology,* 1911, Vol. xvi.
5. M'Gowan, *The Veterinary Journal,* 1912, Vol. lxviii, No. 439.
6. Ferry, American Veterinary Review, 1912, Vol. xli, No. 1.
7. Ferry, *The Veterinary Journal,* 1912, Vol. lxviii, No. 445.

NECESSITY FOR MILK AND MEAT INSPECTION.*†

By Louis A. Klein, D.V.M., Dean of School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa.

To discuss milk and meat inspection comprehensively, even with the briefest details possible, would require more time than is at my disposal. Therefore, I have decided to confine my efforts to the presentation of the conditions that render milk and meat inspection necessary and of public importance.

In adopting the milk of the cow as an article of food man has created conditions and requirements not provided for by nature. The cow is admirably adapted to supplying nourishment to the calf at its side. The milk passes directly from the udder of the cow to the stomach of the calf, without opportunity for contamination or decomposition, if the cow is healthy. But when the milk is drawn from the udder by man and used for the nourishment of human beings more or less distant from the cow, the conditions are radically different. The milk is drawn into a pail held under the body of a cow in a stable, opportunity being thus afforded for material discharged from the cow, or falling from its body, or floating in the air of stable, to get into the milk. Then it is transferred to several other vessels and handled by several individuals before it reaches the consumer, and usually there is a considerable interval of time between its production and use.

It will be seen at once that certain precautions are necessary if the consumer is to receive a wholesome article of food. Even the calf suffers when nature's method is interfered with and proper care is not observed in feeding the animal, although it may be kept close by the cow. On large dairy farms it is customary to permit the calf to suckle the cow only during the first day or two after birth, the calf being fed milk from a bucket or

* Read by invitation before the Seaboard Medical Association of Virginia and North Carolina, at Newport News, Va., December 5-7, 1911.

† Reprinted from the Virginia Medical Semi-Monthly.

a self-feeder after that time. Unless the milk is fed fresh and in scrupulously clean vessels, the calf frequently suffers from an acute catarrh of the stomach and intestines, in consequence of the presence of decomposition products in the milk, and if the cause is not removed, death may result. A disease of a similar character, and resulting from a similar cause, is the diarrhea and enteritis of young infants, which, in large cities, causes five to twenty per cent. of the total deaths from all causes. In the case of the infants, however, there is a longer period for the milk to undergo decomposition. Moreover, forcing the cow to high milk production, together with the more or less artificial conditions under which the animal must be kept, has somewhat reduced the natural resistance of the cow to disease, especially to conditions and affections of the udder and the other genital organs, and of the digestive apparatus, the parts more active in milk production; thus rendering it necessary to be on the lookout for the appearance of diseased conditions in the dairy cow, and also to mitigate as much as possible the artificial conditions to which the animal must be subjected. Sunlight and fresh air in the stable, with judicious exercise in the open air, are of considerable value in this connection. "Every farmer loses more in ten years * * * by having unsanitary stables than what it would cost to have made them efficient."—(*Hoard's Dairyman*, p. 1254, November 10, 1911.)

From the time of production to delivery to the consumer, milk is exposed to contamination and subject to decomposition.

If the udder is affected with a bacterial disease the milk will contain the disease-producing organisms when it is drawn. If the disease is located in other parts of the body, bacteria may be thrown off in the manure, in the urine, or by coughing, and may get into the milk after it is drawn from the udder. Some of these organisms are capable of producing the same disease in man as in the cow; others will not produce the same disease, but will irritate the gastro-intestinal tract or bring about decomposition changes in the milk, accompanied by the production of substances which will have an irritant action. Furthermore, abnormal sub-

stances produced in the body of the cow by disease may be eliminated in the milk, especially when the other channels of elimination are not operating normally. Some of these substances render the milk irritant. In this connection a case that recently occurred near Philadelphia may be cited. Two children receiving the milk from a certain cow developed a low, intermittent fever, refused to eat but a small quantity of food and were constantly cross and fretful. An examination of the cow showed that the animal was affected with catarrh of the gastro-intestinal tract. Laboratory examination of the milk indicated that abnormal material was being excreted through the udder, passing out in the milk. The milk was withheld from the children; in four days they began to improve perceptibly, and in fourteen days were in good health. No medicinal treatment was given. All of these possibilities can be avoided by using only healthy cows for milk production. This requisite cannot be assured, however, by merely an annual tuberculin test of the herd, as is so often assumed.

Particles of manure from the flanks and udder of the cow and hair and scurf from the skin may fall into the pail while the cow is being milked. If the dry fodder is put into the manger before or during milking, the dust from the fodder will be distributed in the air of the stable, and some of it will fall into the milk pail and also into the milk can, if the latter is kept in the barn. If the stable is dirty, or if it is cleaned shortly before milking, additional dust will be carried about in the air, and odors will also arise which will be absorbed by the milk. If the milker has been previously engaged in hauling manure, or cleaning horses, or similar work about the farm, dirt may be added to the milk from his clothing or hands, especially if he has not washed the latter before beginning to milk. Much of this filth can be removed by the use of a strainer, but only the gross particles or visible dirt can be taken out of the milk in this way. The most harmful part of the material, the bacteria that are always contained in it, will pass through the strainer, together with the dissolved dirt, and remain in the milk. These bacteria will grow and multiply rapidly, using up the nutritive substances

of the milk for their nourishment and discharging the waste matter of their bodies into the milk, and by so doing bring about decomposition and putrefaction, with the production of substances that are injurious to the milk consumer. The degree of the intensity of these changes will depend upon the extent of the original contamination, the time elapsing before the milk is delivered to the consumer, and the temperature at which it is kept in the meantime.

A great portion of this dirt, and therefore much of the accompanying bacterial contamination, can be avoided by a decent regard for cleanliness and a few simple precautions. The stable of the dairy cow is not only a place where some of the crops grown on the farm are turned into a better form for the market, but it is also a place where human food is prepared, and should be treated accordingly. Brushing the cows will remove the greater part of the loose dirt, and if the udder is wiped with a clean, damp cloth immediately before milking, any loose particles remaining will adhere to the skin and not fall into the milk pail. The cows should be brushed and the stable cleaned a sufficient time before milking is begun to give the dust time to settle and the odors to be dissipated. The dry fodder should be fed after milking to keep the air as free from dust as possible during milking. The use of a milk pail with a covered top and a small opening is a very great help in keeping dirt out of milk. The withdrawal of the fore milk into a separate vessel before milking will also greatly assist in decreasing the number of bacteria. If the stable is well lighted and well arranged, the floor and gutters of cement, and the stall divisions of iron pipe, cleanliness can be more easily attained. But these things are not necessary to the production of wholesome milk. They are merely labor-saving devices.

Keeping the cows clean and well bedded and in clean quarters will require more labor than to keep them otherwise, but we have the testimony of successful men engaged in the dairy business that cows kept in the condition necessary for the production of wholesome milk will give a greater yield of milk than when they

are kept in uncomfortable filthy stables. C. L. Peck, of Pennsylvania, in discussing the productiveness of dairy herds in his section (*Hoard's Dairyman*, page 498, 5-5-11), said, "I never knew of a herd giving 300 pounds or more unless card and brush were used and liberal bedding provided. In the northern part of Pennsylvania and the southern part of New York not 3 per cent. of the herds ever see card and brush and not 3 per cent. ever reach 6,000 pounds of milk or 300 pounds of butter fat per year." F. H. Schribner, of Rosendale, Wis., in reporting the Neenah cow census (*Hoard's Dairyman*, page 493, 5-5-11), said that of the forty-four herds in the census the six above the 250-pound butter fat mark "kept their cows in a comfortable barn, well lighted and ventilated; they looked well to the comfort of the cow and believed it an important factor in milk production." H. N. Camp, of Tennessee, writes as follows (*Hoard's Dairyman*, page 286, 3-24-11): "I have thirteen cows and after reading an article about currying cows and making my dairyman read the article, in which he did not believe, I induced him to try currying my cows. In one week's time he gained thirteen pounds of butter." Keeping the cows, and especially the udders, clean also helps to protect them against udder diseases, which is quite a serious loss to dairymen.

When the milk vessels are not properly cleaned, the particles of milk and dirt that adhere to them become culture beds for bacteria, and milk placed in such vessels will have a high bacterial content and will sour early. It is not only necessary that the milk pails, the milk cooler and all other dairy utensils, together with the cans and bottles, should be thoroughly cleaned with boiling water and soda, but it is also essential that the water should be from a source that is not liable to contamination. These utensils and vessels are rinsed with cold water after they have been scoured with hot water, and if the water contains disease-producing organisms they will find a favorable medium in which to grow when milk is placed in the vessels, and they will have time to multiply in great numbers before the milk is used by the consumer, especially if it is not kept cool. If the well, spring or

stream from which the water is obtained is receiving surface drainage or seepage, or if there is any open cesspool so located that there may be drainage or seepage into the water-well, spring or stream, any disease-producing organisms, such as the typhoid fever bacillus, that may be deposited in the cesspool with other material, will eventually get into the water and infect the milk in the manner described above. Milk has also been contaminated during cooling by infected water through a leak in the cooler or by the entrance of water into the submerged can. Epidemics of typhoid fever transmitted by milk have been brought about in this way. Milk has also been infected with the bacillus of typhoid fever, the bacillus of diphtheria and the causative agent of scarlet fever by men and women handling milk, who have been in contact with persons suffering with this disease, or who have themselves just recovered from one of these diseases. Milk bottles from infected houses have also transmitted these diseases through the milk. Unfortunately, there is no practical method of milk examination by which we can assure ourselves that milk is free from the infectious agents of these diseases, and consequently our efforts must be directed to preventing them from entering the milk.

The uses to which milk vessels are put are surprising, and sometimes revolting. In this connection the milk consumer is not always guiltless. A physician tells of a bed-ridden patient using a milk bottle to expectorate in. One inspector has seen the baby's clothing soaking in the milk pails. Milk pails have also been used to carry swill to the pigs. On one farm the milk cooler was washed in the children's bath tub. A milk dealer was found washing the milk bottles in the family wash tub.

When the milk is drawn from the cow it has about the temperature of the cow's blood, 101.5° F. This temperature is very favorable to the growth of bacteria, and if the milk is not promptly cooled, the bacteria which have entered it during milking will increase in numbers very rapidly. Milk has the property of inhibiting to a slight degree the growth of bacteria when they are not present in large numbers, but this property is not of suf-

ficient force to be depended upon to prevent the increase of the bacteria originally contaminating the milk and the occurrence of decomposition, with the production of injurious products. To prevent bacterial growth and the attendant decomposition it is necessary to reduce the temperature of the milk to at least 60° F. or below as soon as possible after milking, and to keep the milk at this temperature until it is used. This will require not only the attention of the producer, but also of the transportation companies, the retailer, who delivers the milk, and the consumer.

The necessity for public control of the milk supply is greater to-day than ever before. In the old days where milk was furnished by the family cow of a neighbor, there was not the opportunity there is now in the larger dairies for the animal to become infected with disease, or for the milk to become contaminated, and it was used so shortly after its production that there was not much time for decomposition changes. These simple conditions still exist in rural communities. In a barn containing a single cow or two cows, every condition is more favorable to the receipt of wholesome milk by the consumer. The cow is not only less exposed to disease, but is usually kept under better hygienic conditions, and the cow, the stable and the milk vessels are more easily kept clean, and there is less liability of infection being introduced by the attendants. Moreover, where a milk producer is supplying milk to his neighbors, the element of personal acquaintance, friendship or sympathy also enters into the matter, which is not the case where a dairyman is producing milk to be used by people in a distant city, whom he does not know and has no interest in, and where the milk will also be handled by two or three other persons before its delivery to the consumer, and perhaps be mixed with the milk from several other farms. The larger the city the more distant the places of production and the longer the period between the drawing of the milk from the cow and its use by the consumer, and hence the greater the importance of having milk produced by healthy cows under cleanly conditions and properly cooled and cared for.

The question naturally arises, cannot those having to do with

the production, transportation and care of milk be depended on to deliver wholesome milk to the consumer? Past experience and present conditions answer, No. It has already been pointed out that in the case of the milk supply of a large city the responsibility is divided and that the milk from any one farm may lose its identity by being mixed with the milk from other farms. Furthermore, one price is usually paid for milk in the city and the dairyman who tries to produce a good article is forced to compete with the man who aims to produce milk as cheaply as possible. There is usually no standard of valuation, except the price. These conditions are not encouraging to the conscientious dairyman who may desire to produce a good article. Wholesomeness, or quality in a hygienic sense, should be the standard for judging milk. This would encourage the man who is trying to produce good milk and would shut out of the market milk not produced and handled under proper conditions. Such a standard can only be applied by public supervision of the milk supply.

All efforts to insure a wholesome milk supply to a community should be directed to keeping milk with injurious properties out of the city, or to preventing it from acquiring such properties during storage or delivery, rather than to discovering unwholesome milk after it has reached the city. It is possible to discover some of the injurious properties of milk by examining a sample taken in the city, but while the sample is being examined the milk from which it was taken will under ordinary conditions have been consumed, and, furthermore, such contaminations as the specific causes of tuberculosis, typhoid fever, diphtheria and scarlet fever, cannot be detected by practical laboratory methods. A pure milk supply can be insured only by the same methods as a pure water supply, that is, by cleaning and guarding the source. To insure real safety, therefore, the supervision must include the health of the cows, and the methods of feeding and caring for the same; the cleanliness of the stable, milk house and utensils; the method of milking, and of handling and caring for the milk; the character of the water supply, and the health and intelligence of the people who come in contact with the milk. In addition,

laboratory examination of the product from time to time will be of value in checking and controlling the conditions of operation.

Meat Inspection.

Of the 49,179,057 animals inspected at slaughter by the inspectors of the United States Bureau of Animal Industry last year, nearly 1,000,000 were found to be diseased to a greater or less degree. These animals were purchased by the slaughterers with the knowledge that they would be subjected to inspection, and were, therefore, free from any pronounced external evidence of disease. An important effect of meat inspection, and one that is not always given consideration, is that it keeps visibly diseased animals out of the slaughter house. Moreover, by far the greater proportion of these animals were slaughtered in the West, where animals are raised especially for this purpose and are sent to market young—at an age when disease is not very common. These statistics, therefore, relate to selected animals and cannot be accepted as representing average conditions.

The federal government has no jurisdiction within a state, and consequently the act of Congress requiring the inspection of animals slaughtered for food and meat products prepared from the same, only applies to butchers and packers doing an interstate or foreign business. Butchers selling meats and meat products in the same state in which their slaughter house is located are not subject to federal inspection. The state or local authorities must provide for inspection in such cases. Where there is an abattoir under federal inspection, in which all animals slaughtered are subjected to a rigid examination, with other abattoirs in the same neighborhood under no inspection, the animals most in need of inspection usually go to the slaughter houses where inspection is not maintained. Until the federal inspection system is supplemented by local inspection, meat consumers cannot be assured of a wholesome meat supply, unless they restrict their purchases to meat bearing the government inspection stamp.

There are facts on record to support this statement. In 1907

a system of state inspection was instituted in Pennsylvania to supplement the federal inspection in so far as was possible, and the developments of even the first few months amply justified the move. A few incidents may be mentioned by way of illustration. One hundred and eighty-six cattle, mostly all dairy cows, were examined in four slaughter houses in one city, and forty-three were found to be affected with tuberculosis, fifteen to such an extent that the entire carcasses had to be condemned. In another city twenty-two cattle were slaughtered during the time a state agent was present in the slaughter house, and six were condemned on account of tuberculosis. A state inspector happened in a slaughter house and found a butcher at work dressing a cow. A few minutes later he saw the butcher remove a piece of the liver and attempt to throw it out of sight. The liver was tuberculous, and on further examination the cow proved to be so extensively diseased that the carcass had to be condemned. A lung affected with tuberculosis was also found hanging in this slaughter house, but the carcass had been removed and sold before the agent's arrival. In a slaughter house in another city an inspector found four cows and one bull being slaughtered, every one of which proved to be affected with generalized tuberculosis. These are, of course, unusual cases and do not represent the average of the conditions found. The conditions in Pennsylvania with regard to tuberculosis in animals are no worse than in any other state where extensive dairy farming is practiced and where the supply of milk cows is kept up by shipments from other states. It is a pleasure to be able to say that a large majority of the butchers are in sympathy with the work. This is as it should be. There is no reason why the butcher and the meat inspector should be antagonistic. The object of both should be to give the consumer a wholesome meat supply. The Pennsylvania Meat Hygiene Service cannot provide a complete and continuous examination at all slaughter houses in the state, but the law provides for the establishment by cities and boroughs, and townships of the first class, of local inspection within the limits of their jurisdiction.

Many cities and towns in all parts of the country have endeavored to insure a good meat supply by appointing inspectors

to visit the butcher shops and examine the meat exposed for sale. Much spoiled meat has been excluded from the market in this way, but even where such work is conscientiously done by competent men, the good effect is very limited, because a correct judgment of the suitability of meat for human food can be made only after the entire carcass and all of the organs have been examined. Some of the most serious conditions may escape detection if only the meat is examined, and furthermore, market inspection is practically limited to the detection of meat that is defective in a manner that can most readily be recognized by the purchaser. It is necessary that the examination be made at the time of slaughter, and it is important that it be made by one who has a knowledge of what to look for and where to look for it.

Meat inspection has to do not only with the examination of slaughtered animals, but also with the maintenance of sanitary conditions in the establishment and the proper refrigeration of the meats and meat products, thus providing for the protection of wholesome meat against contamination and for its proper preservation, as well as the exclusion of unwholesome meats and meat products from the market. The sanitary condition of slaughter houses not under public supervision is often deplorable. Not only is the construction of such a character as to make cleanliness an impossibility, but suitable drainage is usually lacking, the water supply deficient, practically no provision for storing bones and hides, and no suitable method of disposing of the blood, offal and refuse. The large slaughterers make a profit out of these latter substances, but the small butcher usually throws them away. Sometimes he feeds them to hogs.

The proper disposal of these refuse substances, especially the organs, becomes important from the standpoint of public hygiene, if certain parasitic or bacterial diseases are present. Dogs may become infected with echinococci, cœnuri and cysticerci, and may in turn infect man with echinococci, and animals with echinococci, cœnuri and cysticerci. Organs from animals affected with tuberculosis, hog cholera and swine plague, may produce these diseases in hogs when fed to them in the raw condition. Hogs may become infected with trichina in the same way, rendering

their flesh injurious to man; and dogs and rats may also become infected with this parasite in a similar manner and assist in spreading the infection. Fluke disease in man, cattle and sheep, and grub in sheep, may be propagated by carelessness in disposing of infected organs, and until the life history of the tapeworms of cattle and sheep and nodule worm of sheep is better known, organs infected with these parasites must be regarded as dangerous. On account of the methods used in disposing of offal and refuse matter, country slaughter houses and those on the outskirts of small towns have come under the suspicion of being centers of infection, especially when they are located along streams, as many of them are.

Where the blood and the other refuse substances are fed to hogs, filthy conditions are usually found. Disease is also transmitted to the hogs and to dogs. At the beginning of the state inspection service in Pennsylvania several lots of hogs fed on raw offal were quarantined and slaughtered under inspection. At one slaughter house where 48 hogs were fed on the raw offal 9 died; the other 39 were slaughtered, and 38 were found to be affected with tuberculosis. Of another lot of 14 hogs fed on offal, 3 were tuberculous and 6 had echinococcus cysts in the liver. In another lot of 8, there were 6 with echinococcus cysts. In a lot of 6 one had an echinococcus cyst in the liver. There was one other lot of 6 hogs, and these were all found to be free from disease, the only instance of the kind. At one slaughter house, where 23 hogs were being fed on offal, hog cholera developed. Ten hogs died and 4 were condemned when slaughtered, leaving 9 for the owner. Disposing of refuse by feeding it to hogs is not only unsanitary, but may also be expensive.

In the small slaughter house there is not enough refuse material to justify the installation of a sanitary rendering plant to work it up into marketable products, and there is no simple, practical method that is economical and sanitary. The small slaughterer is here at a disadvantage. A number of small slaughter houses at different locations also renders inspection at the time of slaughter rather difficult. The centralization of the local slaugh-

tering business in one abattoir of modern construction, including proper refrigerator facilities and a sanitary rendering tank, is the most feasible solution of both of these problems. It will not only provide for the slaughtering under good sanitary conditions, with convenient facilities for competent and economic inspection, but will also make it possible to derive a profit from the by-products obtained from the offal and other refuse matter.

The central abattoir may be a union slaughter house, owned and operated by a company of butchers; an abattoir owned by citizens and designated by the local authorities as the official abattoir, where all local slaughtering must be done, or a municipal abattoir, owned and operated by the local authorities. Trade jealousies have prevented the building of union slaughter houses by butchers, but in Bridgeport, Conn., Buffalo, N. Y., New Orleans, La., and Nashville and Knoxville, Tenn., there are privately owned slaughter houses, in which all animals must be slaughtered under municipal inspection. The meat is marked with the city stamp if found to be wholesome, and no meat may be sold within the city without this stamp or the United States stamp. Birmingham, Ala., and Paris, Tex., a city of only 15,000 population, have municipal abattoirs and are in advance of all other municipalities in this respect.

The experience of Paris, Tex., is very encouraging to those interested in the establishment of municipal meat inspection. Previous to the erection of the municipal abattoir, the same conditions existed in and around Paris as may be found around cities and towns in this state, except that the sanitary conditions were much worse than exist here since the operation of the State Meat Hygiene Service. The municipal authorities of Paris made an effort to improve the conditions, but they did not succeed, principally because the slaughter houses were located outside of the town and beyond their jurisdiction. An effort was then made to have the individual butchers form a stock company and build a central, union slaughter house, but business jealousies prevented the success of this plan. The mayor, Mr. E. H. McCuistion, and others interested then decided to erect a municipal abattoir. Plans

and estimates were obtained, and the citizens were asked to vote on a bond issue to provide the necessary funds, $10,000. The proposition was approved, and the abattoir was erected and began operation in December, 1909.

The capacity of the plant is fifty cattle a day of ten hours, and there are also facilities for hogs and sheep. This is ample for the present needs of the city, and the plant has every convenience and sanitary provision to be found at the largest plants.

A feature worth noting is the location, which is one of the principal streets of the town, with dwellings on all sides—one within 400 feet. Not only the offal from the animals slaughtered, but also dead animals from the city are rendered and reduced in the plant, without offense to people in the neighborhood. Sanitary rendering tanks are used, and the offensive gases and odors are condensed and trapped into the sewer or passed under the fire-box of the boiler and burned. The selection of such a site by the Paris authorities for the abattoir is quite in contrast with the action of some of the local Boards of Health in Pennsylvania in forbidding the erection of slaughter houses within the limits of their towns.

The plant is operated by the city, and slaughtering is done for the local butchers at fixed charges: $1.25 for each beef, and 75 cents for each calf, sheep or goat. These charges cover not only slaughtering, but five days' cold storage and delivery on the hook in the butcher's shop. If a carcass is left in the refrigerator more than five days, an additional charge of 10 cents per day is made. The owner of the animals slaughtered also receives the hide, all of the tallow adhering to the carcass and the "rough fat" of the offal. The city retains the blood and offal, with the fat adhering to the latter, and this is worked up into tallow and tankage, which is disposed of at market prices. The other by-products, bones, hoofs, bristles, etc., are not worked up at the present time.

It was not the intention to make the plant profitable, but only self-sustaining, and in a letter dated February 27, 1911, after the plant had been in operation over two years, the mayor says:

"We are greatly pleased with it, and have found it abundantly self-sustaining in every way. We fully believe our system offers a very practical and economical solution of the local meat problem in all small cities."

He also says:

"We have demonstrated to the satisfaction of every local butcher that we can hang a carcass on the hook in his shop cheaper than he can; and further, that there is no legitimate comparison between our system and the old one we formerly employed."

A thorough inspection is made of all animals slaughtered in the abattoir, including an ante- and post-mortem examination. The chief inspector is a graduate veterinarian, who had had previous experience and training in the service of the United States Bureau of Animal Industry. When an animal is rejected on ante-mortem examination the owner is notified, and the animal is at once removed from the stock pens. If the carcass is condemned on post-mortem examination, it is placed in the offal tank and the owner is paid the value of the tallow and tankage. The chief inspector has charge of the plant. The regular employees include two slaughterers, one driver, one engineer and one "dead stock" man.

Slaughtering at the municipal plant is not absolutely compulsory, but an ordinance requires that all slaughtering must be done under the same sanitary conditions as exist in the municipal abattoir, and the result is that all local slaughtering is done at the city abattoir.

MR. BENJ. H. MOUNT DID NOT HAVE GLANDERS.—Recalling Chairman McLaughlin's detailed report to the December meeting of the Veterinary Medical Association of New York City, on the case of Mr. Benj. H. Mount (who was supposed to have been inoculated with the discharge from a glandered horse) which ended with the words: "The committee concluded that the patient did not exhibit any positive symptoms of glanders," it is gratifying as well as interesting to note that Mr. Mount did not have glanders, that he is alive and well, and driving a truck every day.

DIET DEFICIENCY AND DISEASE IN LIVESTOCK.*

By Fras. Evelyn Place, B.V.Sc., M.R.C.V.S., etc., etc., Veterinary Lecturer to the Department of Agriculture, Adelaide, South Australia.

Highly as I esteem the honor of being invited to submit a paper before such a learned and erudite body as the Australasian Association for the Advancement of Science, and much as I appreciate the opportunity held out by that body to enable the veterinary surgeons of the Commonwealth and Dominion to foregather under the aegis of its patronage, I feel that as a comparatively new comer I should more fittingly assume the rôle of a postulant at the feet of such Gamaliels than take upon me the robe of a teacher, and it is in this frame of mind that I venture to occupy your attention for a short while with some of the aspects presented by the connection between diet deficiency and disease in livestock. Some of the phenomena attracted my attention many years ago during dry summers upon the moors of Devon, but during the Indian famine of 1904 and 5 I began to collate certain symptoms and to assign to them in my own mind a chemico physiological importance in the conditions which prevailed among the livestock in the famine stricken desert of Rajputana, and upon my arrival in Australia some three years ago, I found in Victoria and South Australia that the minds of stockowners were being exorcised over similar if not identical problems quaintly named in the latter state "Dry Bible" and "Coasting," while Tasmania and New Zealand meet with trouble possibly more akin to the English forms in "Midland Disease" and "Bush sickness," and South Africa joins in with Lam and Stieffziekte, and in the face of all of them the veterinary pro-

*A paper read before the Veterinary Section of the Australasian Association for the Advancement of Science, at Melbourne, 1913.

fession has unfortunately to admit its ignorance of the causative factors and has to adopt empirical remedies such as bone meal and to endure a certain amount of scorn from the ignorant and unscientific who know all about it, while the profession is still delving amid the mass of contradictory report and confusing symptoms in an earnest, and I hope soon to be successful endeavor to elucidate the reason of phenomena noticed.

If I may be allowed I would revert for a few moments to a number of diseases which affect ourselves and which I may refer to as belonging to groups such as the beri-beri, the scurvy and the pellagra groups and which are recognized by a large and increasing number of scientists as yielding to suitable diet, and I would class myself among the believers that they are caused by deficiency of certain food elements, the absence of which has a marked and serious effect upon tissue metabolism in nerve muscle and bone, a group of organs which compose about 60 per cent. of the bodies of our domestic animals and which hitherto have received more attention from the breeder of livestock than from the veterinary surgeon, if we omit those which build up the legs of a horse, in which the psalmist warns us not to put our trust, plainly with prophetic vision foreseeing the advent of motor traction and its effects upon the income of the veterinary practitioner.

For a moment I will briefly sketch the symptoms of beri-beri as I have seen them occurring in some poor wretch who has vainly been endeavoring to keep body and soul together upon a handful of moldy weevilly rice. And then I will try and draw a parallel from a horse dying in the ninety-mile desert.

The patient loses weight till he is reduced to a skeleton, oedema, contractions, paralysis and anaesthesia of the limbs, marked nervous symptoms, due apparently to degeneration of the peripheral nerves and those of the heart muscle, followed by death or recovery without any treatment beyond a change of locale, with most probably important additions to the defective diet. So much for the human animal, now for the equine: The collar grows too large, fresh holes have to be punched in the

girths, the legs swell and the spur vein fills, he trips and totters, and without notice collapses on the sand without a groan or struggle, with spume at the nostril and nought but hide upon his ribs. Or look for a moment at a case of scurvy, with its anaemia and cachexia, its local hemorrhages and hemorrhagic inflammation, the spots upon the ribs, their dislocation from the cartilages with perhaps neuritis and anaesthesia of the limbs, and compare it with a coasty heifer with her bloodless eyes and bottled jaw, her gaspy breath, due to her ribs failing to distend, her tottering walk and swollen fetlocks, and finally her feeble helpless efforts to control her limbs and raise her wasted carcase.

Is not one justified in asking: Are these mere coincidences or is there not a closer connection? For my own part I think there is, and it is interesting to note how veterinary surgeons have accepted and rejected the same theories with regard to this class of disease, as have members of the sister profession, though they have worked apart. Intoxication, auto-intoxication, infection, and even the photodynamic theories like ancient dynasties have risen, held their sway and gone, while now the deficiency theory has been hinted at by Theiler, Gilruth and Aston, though but tentatively, and as through a glass darkly. For to us the proteid has been a mass, a pyramid viewed in the mist of early dawn. and in the noonday heat its building stones have but afforded us shelter while we slept, their individual characters, their cryptic signs are still to seek, and perhaps at eventide there shall be light.

The cow with her hide-bound belly and stiff stretched neck, chewing the bones of some less lucky mate, has suggested the want of phosphorus and kindly consideration has provided a bone meal lick, but is not this significant of a certain amount of rough and ready argument forced upon the veterinary surgeon by the pressing need of staying the plague, and is it not characteristic of a certain roughness in feeding experiments which have been carried out? We see the proteid, the carbohydrate and the fat, the tricolor which proclaims the revolution, but we are deaf to the groans, the gabelle raises, we think the miller but dips out a

negligible mite, we wonder when red ruin racks our state we fail to miss the amides of our meadow hay, we ignore the subtle ethers which scarce move our chemist's scale, and wonder when our beast falls, never to rise again.

Lead by the chemist whose accuracy far exceeds our own, we have framed standard diets with correct nitrogenous ratios, we have carefully balanced the income and the outgoing, at least in theory, and our American cousins have also in fact, in some careful series of experiments, especially those carried out at Wisconsin, without success. Here in Australia we have no data re the composition of our common feed stuffs, we know less about them than we do of the component parts of a German sugar beet or an Indian millet and our ignorance falls upon our own heads in the nemesis of dry bible and coast. South Australia at least is endeavoring to lift the veil of this darkness, but many years must elapse before the observations and experiments now being carried out at the Agricultural college Roseworthy can be finalized, though from time to time parts of them may be available. Up to now we have no Australian analysis of Cockie chaff or wheaten hay, our grasses and native clovers are unknown quantities, but when we seek them out we must remember that caloric figures are incomplete records of the value of a food stuff, and that the innate metabolism of a grain has a physiological value which we cannot weigh or count in figures. In short, that the feeding value of any food is based upon almost complicated chain of factors, each dependent on the other till the mind becomes dazed at the number of combinations any one series may present.

The appearance of the stock in the dry districts of South Australia leads one to think that a very large amount of feeding value of their forage is expanded in maintenance, more than the five-twelfths of Kellner's observations, even those which are keeping their condition, give one the impression that too great a proposition of their energy is expended in managing to live, to use a feeder's expression they have no "bloom," or in butcher's terms they "kill light." A somewhat extensive acquaintance with these beasts in the slaughter house supports this

idea, their musculature is devoid of inter-muscular fat, and its water content is far too high proportionately, so they shrivel when they set and resemble biltong more than beef, and when canned their gravy is gelatin rather than jelly.

A high proportion of this class of beast has an acid reaction with the urine, which is also the case in dry bible, and in some forms of coast disease, anent which it is interesting to recall the note in Smith's Physiology. "When the herbivora are starved their urine gives an acid reaction." Now as physiologists we must look further than the kidneys and bladder for the origin of this change and we find it no doubt in the muscles. This is not the place, nor if it were, would time permit to go into detail as to chemical changes in the muscles, but it is worth noting that they become strongly acid in reaction when the call upon their endurance is excessive, either as labor or as deficiency in nutriment. In this connection we must call to mind the fact that food deficient in nutriment not only fails to nourish but also lowers the digestibility of nutritious food fed with it, so that large feeds of straw chaff with a modicum of inferior wheat such as form the standard diet of many horses do not conform to the requirements of their system even when liberally diluted with sand, nor are they calculated to produce meat or milk.

At first glance the analysis of certain straws does not show them to be entirely unsuited for use as food, but wheat straw seldom shines out well, Kellner's figures being: Water, 13,6; nitrogenous substances, 3, 3; fat, 1, 3; soluble carbohydrates, 39, 4; fibre, 37, 1; ash 5, 3 with a digestibility of less than a third of its weight.

And this is the diet on which a large proportion of Australian stock are supposed to find their nourishment. For an analysis of wheaten hay we have to go to America, and it is by no means improbable that the analyses made there are those of a fodder differing in many effective elements from the same substance here, but it shows a marked improvement in the nutritive ratio and reveals the fact that Cockie chaff probably saves the situation. It is to be hoped that the Roseworthy experiments and

observations will set this matter more clearly before the feeder. The careful study of the analyses of the common fodders in use in Australia is of value, but analysis alone is most misleading, digestibility is a better guide, but assimilation is not synonymous even with this, as the appearance of stock on much country, where undoubtedly they are digesting a fair proportion of what they eat clearly shows, for frequently a change to land which does not seem so good brings about an alteration for the better. When dealing with metabolism in the tissues we are dealing with only a limited series of factors, metabolism in the fodder itself while growing and after cutting and while in store, to say nothing of the natural action of the enzymes of the digestive juices in partnership with those of the fodder are all issues which have to be studied both alone and in conjunction.

In Australasia livestock present the symptoms of the great groups of deficiency diseases observed in man, the beri beri group is typified by the so-called epizootic paralysis and the disease in horses where the collapse is so sudden that death may occur upon a journey without warning reminding many who went to the war in South Africa of the fatal horse sickness prevalent in that country, whose lam ziekte and stiffziekte have their counter parts here in neat stock as coasting and dry bible. The scurvy group appear in horses, cattle and sheep in forms widely known but generally receiving local and often unmeaning names such as crankums, rheumatoid arthritis and so on. The pellagra group also have their counter parts in skin and stomach lesions in the central and northern districts of Australia, the midlands of Tasmania and the north island of New Zealand, a chain of tracts which have in common scarcely any climatic or botanic similarities, which fact almost forces on one the necessity of falling back upon physiological resemblances.

Fagopyrismus in cattle and epizootic paralysis in horses naturally turn the thoughts to the study of the balance of metabolic factors and their influence on the major physiological processes in livestock, because they are instances of the disastrous effect of very slight alterations in those balances. Among phy-

sicians one school scoffs at the labored triturations of the other, which in turn smiles in pity upon the germ bespangled broths and jellies of the other, and both in turn are the sport of yet a third party which, while deriding drugs or sera, agitates the public mind with the desire for frequent change, both in venue and diet, to say nothing of habits and thought, and between them nature waves her hand and produces eggs and cream, lamb chops and Murray cod, strawberries and apples, ale and tea, all just proteids, carbohydrates, fats and water, yet every one distinctly different and pleasing in their variety by their distinctive characters, which are to a great extent amides or amido acids almost negligible from an analyst's point of view, but recognizable by the working bullock that suddenly pulls up to crop some succulent weed by the roadside, or the colt which, browsing by its dam, picks off the dainty tops that please its palate, and even the farmer seeks for them when at this time of year he bemoans the fact that pastures so good three months ago are not able to carry the stock now, though, minus the water, the crop upon them is probably weight for weight richer in proteids, etc., than it was then.

And here we must pause a moment to consider an important factor which probably has much to do with deficiency in Australian fodder, namely the fact that plants grown in dry heat are deficient in many of their natural amides, that when present these undergo metabolic changes which render them unadapted to the use of stock, a fact unpleasantly forced upon my notice some few years ago in Burma by the untimely and numerous deaths of ponies fed upon phaseolus lunatus and similar legumes grown in a dry district, while lower down in the moister parts the same plants were fed regularly without harm, and I have no doubt that the contradictory reports about Soya beans in England arise from the conditions under which they have been grown in spite of the similarity of the analyses in all such cases.

Recent investigations by the Commonwealth Statistican have demonstrated the curious effect upon the birth and death rate of varying quantities of moisture in the atmosphere as applied to

man, and the practical farmer daily demonstrates the same thing in his movements of stock, while the creek and the waterhole seem to be the determining factors in the utilization of the amides in the fodder illustrated by the saying I heard some thirty years ago in the Riverina, that if the sheep could have a blade of grass one day and a drop of water the next they could weather through the drought, but with the grass alone they could lie down and die.

Research has demonstrated that in the large nerve organs as well as in the peripheral nerves of animals that have starved, or in the polyneuritis of pigeons, and in the impaction paralysis of cattle there is a marked deficiency in the normal phosphorus content of those organs despite the fact that phosphatic content of their food has been ample, and one knows how very disappointing from a therapeutic point of view the administration of phosphorus proves to be in many cases, while in others it seems to act like a charm. A series of analyses of the phosphorus contents, both actual and relative, of the otoliths in paralytic stock would probably illuminate the obscurity of many of the symptoms.

When one considers that the caloric energy of bad grass hay, as compared with good grass hay, is very little more than half and that five-twelfths of the amount of food eaten has to be used for maintenance, also that the wastage of bad hay is double that of good, and that the more inferior the fodder is the greater the depression of digestion, also that when in conjunction with these factors they are all intensified if the water supply is insufficient, one is bound to consider that under some Australian conditions livestock must be chronically upon the verge of starvation, which, as a matter of fact, is just the impression that I gained when first studying these conditions, although an absence of thirteen years from England and an extensive acquaintenance with the appearance of stock in India under famine conditions should have familiarized me with the symptoms of existence under such disadvantages. One notices that when phosphorus is available as when bone meal is given that the nerve lesions are

minimized, but that the appearance compatible with bloom and health are only restored when natural fodder in an actively growing stage is to be had, unless one makes an exception in the case of stock receiving ensilage, a form of nourishment in which if the natural amides have undergone change their place is taken in some degree by ferment products nearly allied to them. In this connection one's mind reverts to the empiric remedies of currants and yeast, the administration of which is undoubtedly followed by a measure of success in this class of disease which cannot fairly be attributed to a merely mechanical action upon the ingesta.

One other point must be called to mind before we commence to collate the clinical facts we have ben considering and that is the frequency with which enlargement of the thyroid is met with in the class of disease under consideration, one finds this in all classes of stock, colts, calves, mares, geldings, cows and steers, a list which excludes those whose generative organs are immature or male animals which, as a rule, are fed with a diet of superior order.

It may be that from a clinical point of view I have not brought forward sufficient evidence to convince many that we are dealing with groups of diseases resulting from diet deficiency, that is deficiency in some essential necessary for the normal physiological processes, diseases that may still be regarded by many as intoxications, a view I must confess I still have a hankering after although my faith in it is daily being undermined by the contradictory and inexact statements which are constantly being put forward with a view to make its position more tenable, but we have the fact that these deficiency diseases break out in countries where a certain unvarying diet is partaken of for long periods, while near by stock seem to be exempt from their attack, due no doubt to some minute alteration in the diet which contains the necessary protective bodies.

As I have already alluded to the similarity in the course of the symptoms I may here merely remark that the most prominent ones are found in all the diseases we are considering,

namely a general cachexia with enormous loss of weight, marked nervous symptoms due most probably to degeneration of the peripheral nervous system, centripetal rather than eccentric. And, roughly, we know that all these diseases can be prevented by the addition of certain substances to the food, and in some cases when the disease is not too far advanced a cure may be hoped for.

In the case of human diseases these substances are known to be organic bases and are termed "Vitamines," those of the beri beri group and the scurvy group being well recognized and to some extent being interchangeable, though not always. Although veterinary research has not so far gone thus far, veterinary clinical observation which I believe I may justly claim as being keener than that of the sister profession has supplied the missing substances in crude form, bone meal, ensilage, cattle spices, and so forth. While the beans, always considered necessary for muscular growth and fitness in training stables, supply the vitamines in profusion. Facts that Gryns and Eykman applied to the treatment and investigation of deficiency diseases and which Worth and myself experimented with in Burma finding that the protective substance is soluble in strong alcohol and effective even after the elimination of alcohol soluble proteids. The fact that the phosphorus content of some fodders acted as an index to their harmfulness or otherwise suggested that probably there was a deficiency of certain organic phosphorus compounds in the food which has sufficed for Schauman to construct his phosphorus deficiency theory. Investigation has proved that the protective substances whichever they may be are: Soluble in alcohol, in acidulated alcohol and water. Dailysable. Destroyed by heating somewhat above 100 C. They are neither salts nor proteins. They are easily destroyed by chemical manipulation and on this account have most probably escaped the observation of earlier investigators.

Funk concluded that owing to the stability of certain substances from yeast in acid solution that these protective substances are probably nitrogenous, of simple chemical nature and

belonging to the group precipitated by phospho tungstic acid, and tracked them down till he obtained a compound with the formula C 17. H 20. N 2. O 7. The quantity of this substance present is extremely small, 1 kg. yielding only 0 5, g, and the curative dose was found to be very small indeed, but varying with conditions of nerve degeneration and subsequent diet resulting in some critics considering the substance to be merely an activator, a member of the group of hormones. Subsequent investigation, however, upsets this theory and gives rise to another that the neuritic symptoms of starving animals are dependent not only on phosphorus deficiency but also on nitrogen deficiency in the nerve organs, and that in the absence of the vitamine the organism cannot synthetize its nerve elements and so deficient metabolism ensues and death results. Here the yeast and currants of the empiric tell.

Vitamine is necessary for the metabolism of the nervous tissue and its lack forces the animal to take this substance from its own tissues. The result is enormous loss of weight, and when the available stock begins to run short there is a breaking down of the nerve tissue and the resulting symptoms, among which in the southwestern parts of South Australia is the form of epidemic dropsy, so reminiscent of the so-called wet beri beri.

I have already drawn the parallel between some forms of "coast" and scurvy, the later being so prevalent on a diet of starch and preserved food and yielding so easily to lime juice and fresh fruit and vegetables, especially onions, as I, after some months on boiled milk and brandy, have reason to be thankful for. The prevalence of scurvy of the gums is responsible for many of the dental troubles which supervene on the attentions of quack horse dentists, and is possibly the reason for the existence of these operators.

One of the symptoms of this form of disease in cattle in South Australia is a blue hyperaemia of the gums and in some instances ulceration, which have misled me into imagining I had lead poisoning to deal with until undeceived by chemical

analysis. In human scurvy only fresh food possesses the protective power, dried material is entirely valueless, but lime juice apparently is possessed of a greater quantity and that more stable and offers a promising therapeutic remedy for stock.

In the process of germination seeds are known to develop all kinds of enzymes in order to utilize their food reserves, and grains such as oats develop an antiscorbutic agent after they have germinated, but they lose this power when they are dried again. This is also true when the process of ripening is not completed, so that the shrivelled wheat in Australian hay is probably unable to carry on this process even although its nitrogen content is high.

Infantile scurvy is not uncommon in factory fed calves and pigs receiving waste milk which has probably been preserved by heat. And although the vitamine in milk is fairly stable, it is destroyed by heat, the extent of its destruction depending on two factors, the temperature and length of time of heating. Further factors, says Funk, in a passage which is pregnant with importance to Australian dairymen, are: The reaction of the milk, the natural content of vitamines in the cow's milk, which, of course, depends entirely on the content of vitamines in the cow's food, and so far we know nothing about them, except the financial loss such ignorance entails.

All the symptoms of the disease we are considering can be produced in miniature in guinea pigs. The loss of hair and weight, the paralysis of the hind legs and catarrh of the intestines, by a deficient diet, not deficient in quantity but in protective substances. And their blood is sterile, like those other beasts we deal with. The results of modern investigations in deficiency diseases are not well known to physiologists and are practically unknown to veterinarians, though Mandel and Emil Fischer have long ago forecasted the results at which we are arriving and have pointed out that these substances protective have been too easily overlooked.

In the metabolism experiments, performed with a view of

determining the nutritive value of different proteins, the question of vitamines has not been considered, but if they are not present, even though the nitrogen content is high, the animal wastes and fails, and in future experiments they must be carefully considered. Abderhalden's experiments in feeding dogs with their own proteins and his rather too premature conclusion that the question of artificial food is solved have their value in calling our attention to the length of time an animal can survive upon its own tissues or those closely allied to them and enable us to understand how the famine cow survives upon dried dung cakes, or the dry bible beast on mummified rabbits that have succumbed to phosphorus in overdoses.

Many years of careful work are still before us before we know much about vitamines and similar protective substances, but my purpose will have been served if by these few observations I have succeeded in arousing among my professional brethren a fleeting interest in them, for it is quite possible that their importance is much greater than has been hinted at in this paper, and a predisposition to many other diseases may be due to a deficiency in these protective substances.

We shall see the whole importance of these protective bodies when we know for what purpose these small quantities of substances are required in the animal organism. It is obvious that the minute amount necessary cannot be considered from the point of view of food, unless they are the ambrosia and nectar of the ferments and hormones, or the favored vintages of the internal glands such as the thyroid and pituitary.

The further investigation of vitamines, the knowledge of their chemical composition and their fate in the animal body should help to eliminate from veterinary phraseology such classic terms as dry bible, enzootic paraplegia, coasting and other high or low sounding titles which mean nothing and only serve to raise a smile upon the faces of those who deem we are endeavoring to hide our thoughts in words.

Summary.

The connection between deficiency in certain food elements and disease in livestock has occupied the writer's attention in England, India, Burma and Australia, where the class of disease is known under various local names, as "dry bible," inpaction, coasting, Midland and Bush sickness, and corresponds in many ways to the South African Lam and stieffziekte. But in all the countries there is a lack of accurate knowledge of the cause, though veterinarians treat the forms of disease with a certain amount of success in an empirical way by giving bone meal licks yeast and similar remedies.

The similarity between the main symptoms of these diseases and human beri beri and scurvy lead the writer to compare the literature of the human animal diseases which reveal the want of analyses of common Australian fodders, a want that is being remedied by observations at the South Australian Government Agricultural College at Roseworthy; while the failure of rations based solely on chemical analysis has clearly demonstrated a deeper cause for the trouble as well as showing how deficient many fodders are in necessary feeding elements and how chemical changes occur in the animal frame on account of the low feeding value of many of them which really produce slow starvation in which climatic conditions take an active part.

The elements found deficient in the brain and nerves are nitrogen and phosphorus, which are supplied in some degree by the empiric remedies. But the diseases really result from a deficiency of certain protective bodies in the food termed "vitamines," which give the aroma to hay and chaff, they are chemical substances easily altered by heat and other agencies and they act as nerve food, those in milk stand heating better than those in fodder, but still the fluid loses much of its value by lengthy heating. These substances have hitherto been sadly neglected in feeding experiments upon which they have so great an influence, and when absent from the food the animal has to draw upon the small supply in its own tissues resulting in failure of the proc-

esses of life. The writer hopes that the aim of this paper to interest physiologists and veterinarians in the closer observation of these protective substances will bear fruit in a fuller knowledge of their value and change from the local meaningless names of the diseases to ones having a scientific signification.

REFERENCES.

Kellner, The Scientific Feeding of Animals.
University of Wisconsin, Various Reports on Feeding Experiments.
University of Wisconsin, Research Bulletins 14-18.
Armsby and Fries, The Influence of Type and Age upon the Utilization of Feed by Cattle.
Ashton, B. C., The Chemistry of Bush Sickness.
Ashton, B. C., Departmental Report N. Z., 1910.
Ashton, B. C., Journal of Agriculture N. Z.
Bruce, Report, Tasmania.
Theiler, Agricultural Journal, South Africa.
Shaw, T., Feeding Farm Animals.
New York Agricultural Experiment Station, Ann. Rep., 1901.
Renard, A. H., A. B. C. of Scientific Stock Feeding.
Thiel H., Landwirtschaftliches Jahrbuch, 1911.
Casimir Funk, Journal of State Medicine, 1912.
Manson, Tropical Diseases.
Hebrard, Le Beri Beri.
Eykman, Virchow's Archives.
Fraser and Stanton, Lancet.
Schaumann, Arch. f. Schiffs- u. Tropenhygiene.
Kilbourne, Philippine Journal of Science.
Mandel, Physiologie.
Chittenden, Nutrition of Man.
Abderhalden, Zeitschrift f. Physiologie.
Smith, Veterinary Physiology.

DR. E. D. HUDSON, Gettysburg, Pa., poetically writes: " Dear Editor—

" You can count my check for $3 more,
And send the REVIEW same as before.
It's always worth the coin you ask
To get it monthly, like in the past.
It's found on my desk from morn till night;
I read it through with much delight.
You can bet your boots I will stick to you,
You grand old AMERICAN VETERINARY REVIEW."

This is not the first time our readers have read Dr. Hudson's poetic enthusiasm in regard to the REVIEW.

RHEUMATISM.

By F. G. Whitehead, V.M.D., St. George, Utah.

All those diseases of locomotory organs which arise from cold and run their course, causing severe pain in various parts of the body and producing incapacity for movement in the organs affected, have been classed under the name of rheumatism. The muscles, aponeuroses, tendons, sheaths and articular synovial membranes are specially prone to this affection. Such a classification is quite unacceptable, since other diseases make their appearance after severe exposure to cold, and cold has not been proven to be the definite cause of rheumatism; in fact, some forms of rheumatism are very likely due to infection. Two forms exist, and in order to be more exact the form due to cold or muscular rheumatism will be dealt with first, leaving the articular form until later.

A differentiation between the two forms is quite difficult in domestic animals; in fact, sometimes impossible, due to complications of both forms existing at the same time. In the muscular form we have a myositis, while in the articular form a polyarthritis; supposedly due to different causes and nothing in common, except the disturbance of function and pain produced.

Etiology of Muscular Rheumatism.—Most common in horses, dogs and cattle, but not rare in sheep and pigs. Two of the dogs at the Berlin Hospital are affected with this malady. Cold is regarded as the chief cause; *i. e.*, damp, cold weather, cold winds and draughts, poorly constructed stables, wet pastures and rapid cooling of overheated animals. This disease is seen most in the changeable weather of fall and spring. Young animals poorly nourished or old emaciated ones seem most prone. The cold is supposed to act as an irritant upon the peripheral nerves of the skin and is by them reflexly transmitted to nerves

and vessels of the muscles, causing circulatory disturbances and finally an inflammation of the separate muscle fibres. The old theory that by suddenly checking the perspiration and retaining poisonous substances, that would otherwise have been eliminated, seems to have few supporters at the present time. Some think it is due to an infection, but no one has been able to reproduce the disease through an infectious agent.

Post-mortem Changes.—In mild cases no changes are manifest, but in severe cases specific changes are present; *i. e.*, hyperemia, hemorrhages, serous exudation into the interstitial connective tissue, softening, discoloration and disintegration of muscular fibres. Where the affection is of old standing inflammatory proliferation may be noted in the form of rheumatic nodules. Atrophy of the muscles is a common sequel of chronic rheumatism. Cloudy swelling, fatty and hyaline degeneration of muscle fibres along with rapid degeneration is of pathologic importance. The aponeuroses are diffusely reddened with a serous infiltration, the muscles being highly injected and of bright red color. Fatty degeneration may entirely displace the muscular striation.

Symptoms in Horses.—Single groups of muscles and especially those of the extremities are most likely to be affected. The attack comes on suddenly, the gait becomes stiff, strained posture and incomplete action of the affected muscles; for example, the animal's steps are shortened and backing may be impossible. The affected muscles are tense and painful to the touch and they may be surrounded by an edematous swelling. A characteristic sign is the shifting of the lameness from one leg to another, the primarily affected one recovering rapidly. Recovery upon exercise with recurrent attacks are also suggestive of rheumatism. Shoulder and lumbar muscles are often affected; in the former the stride is shortened and the gait is stiff; on backing the foot is dragged and lameness is increased on going up hill or on soft ground. Where the extensors are affected turning the animal in a circle produces most pronounced lameness. Affection of the loins or lumbago shows itself in a

stiffer carriage, sensitiveness and weakness over the lumbar region, a dragging gait, difficulty in rising and even complete immobility of the hind legs. Hip muscles may be implicated, causing a dragging gait and possibly collapse when more weight is thrown upon the affected limb. Rheumatism of the intercostals is rare if ever present in the horse. Where widespread we note some fever (104° F.), increased pulse and respiratory rate, but if localized no systemic disturbances are encountered. Severe cases may be complicated with catarrh, colic, pleuritis and rarely with the articular form.

Cause may be either acute or chronic, recovery taking place in some cases during the first few days. Relapses are very common and once an animal has had muscular rheumatism he is very likely to be reattacked. Where the shoulders or loins are affected we are very liable to have a chronic case lasting sometimes for years.

In cattle the symptoms are quite the same as in the horse, except that the articular form is often associated with the muscular form. As in the horse the shoulders and loins seem to be most prone to an attack, and we may either have a localized form or a widespread one in which nearly every muscle of the body is affected, here the animal is stiff, won't move unless forced to, and groans continuously. The muscles are tense and painful and in acute cases the temperature is 104-6 and breathing quick and labored. Usually the chronic form attacks cattle, but the acute form may also, and death is often reported.

In dogs the rheumatic process is usually localized in the muscles of the neck, shoulders and back, but may affect any part of the body. Yelping and howling upon least provocation is quite characteristic. Lifting or even touching the animal causes pain and fear. The movements are stiff, strained, animal is fearful and timid, neck is held with a peculiar stiffness and the dog lies down continuously. Shifting and recovery of a once affected muscle is seen very often and in a short time the dog may appear in apparently good health. If the jaw muscles are not affected the appetite remains good. Due to painful de-

fecation constipation is the rule. Chronic obstinate cases are often encountered.

Among lambs the disease appears in either a local or general form, rarely attacking the older sheep. The gait is stiff, back and neck held rigid, often the head is drawn to one side and lumbago is often present. Pain is manifest as in other animals and lying down continuously is often suggestive. Both the acute and chronic forms have been reported.

In pigs as in cattle this form is often associated with articular rheumatism. The animals walk with pain, have a stiff gait, and the back is held rigid. Gastric disturbances are common in pigs and even paralysis of the hind parts is frequent. Epizootic outbreaks among pigs have been noted.

Differential Diagnosis.—Affections of the bones, joints, hoofs and tendons may give us trouble, but before making our diagnosis we should exclude the lower bones of the legs by means of cocaine. In the articular form we usually have a high temperature, painful swelling, and localized pain over the affected joints, but in deep seated articular forms we may be quite at a loss to discover where the trouble lies. Lumbago may be misconstrued with paralysis of the hind quarters, due to affections of the cord, but the cause can usually be outlined. Hemoglobinuria is regarded as a severe rheumatic myositis of the lumbar muscles, but in ordinary rheumatism we have no hemoglobinuria. We may confuse muscular rheumatism with pleuritis, nephritis, osteomyelitis and in cattle with cerebro-spinal meningitis.

Treatment.—For localized muscular rheumatism external applications and massage are especially indicated. Spirits of camphor, either alone or combined with oil of turpentine, mustard oil 1-50, spirits of ammonia 1-15, or tincture of arnica are usually employed. Friction is the most important; Priessits's bandages or cold douches followed by warm dressings, finally trying to incite perspiration, is very effectual. For chronic shoulder rheumatism inject veratrine ¾ to 1½ grs. in Mxx of alcohol, increasing the dose 1/6 gr. daily, omitting every fifth day; exercise after each injection to alleviate restlessness. Lumbago, especially

of dogs, may be benefited by an injection into the lumbar muscles of morphia gr. ii B. D. In general, muscular rheumatism salicylic acid or salicylate of soda is to be recommended and ofttimes in the local form these drugs prove of great value, though they must occasionally be long continued; for horses ¾ to ℥iss T. D.; for dogs gr. xxx to ℥i. The salicylate of soda is to be preferred since the acid exerts a corrosive action on the M-M of the stomach. Best given in pills or electuaries to larger animals; in solution to smaller ones. Salol (phenyl salicylate) and aspirin are used for smaller animals and in man they have attained widespread renown; they are somewhat expensive for our use; given in doses of gr. x T. D. Antipyrine has of late been used for smaller animals and may be given in x-xx gr. doses. Laxatives are quite generally used and tartar emetic is given in feverish cases. Tincture of colchicum is a gentle purgative and some think a rheumatic specific for dogs in v-xvm doses T. D. Diaphoretics have been used with good results; *i. e.*, arecoline hydrobromide 1½ grs. pilocarpine hydrochloride in large doses 6 xii grs., dissolved in ℥ii of water and injected beneath the skin; when sweating commences guard against cold draughts and blankets are indicated.

Articular Rheumatism.—An infective febrile disease accompanied by inflammation of several joints and systemic disturbances. Most common in cattle, goats, dogs and pigs, rarely seen among equines. This form is but one-fifteenth as frequent in dogs as is the muscular form.

Etiology.—Formerly cold and such causes as were given for the muscular form were supposed to be conductive, but of late this disease, both in man and animals, has been found to be of an infectious nature, though chill may predispose to an attack. The infection is manifest by general feverishness, the simultaneous affections of several joints, the endocarditis which is often a concomitant, its outbreak in model stables and its close connection with retention of the after birth. Some regard this disease as due solely to the septic material absorbed from the uterus. An epizootic articular rheumatism has been reported among goats. The organism has not been isolated, but streptococci are sup-

posed to be responsible. Difficult parturition, abortion and failure to expel the placenta have been found to accompany nearly all recorded cases of articular rheumatism.

Post-mortem Findings.—Principally consist of a serous synovitis and in chronic forms inflammatory, degenerative modification of the joints. A suppurative synovitis is rarely found. Several joints are usually affected at the same time. In acute cases the synovial membrane is highly reddened, permeated by hemorrhagic spots, swollen, often thickened and the villi enlarged. The synovial fluid is increased and of a reddish tint. The articular cartilages are reddened and later show a yellow, roughened surface. A periarthritis is seen and the surrounding tissues are infiltrated with serum and small hemorrhages; the connective tissue is swollen and gelatinous, and the neighboring muscles are swollen and softened. The articular ends of the bones are hyperemic and hemorrhagically infiltrated. In chronic cases a thick connective tissue covers the articular cartilage. In rare cases (as is often the case in man) a deforming arthritis is produced. Endocarditis, pleuritis and peritonitis are often concomitants.

Symptoms.—Swelling of the joints, often appearing suddenly and reaching a considerable size. The carpal, tarsal and knee joints seem to be most prone. The swellings are hot, painful, skin tightly stretched and in some cases we may be able to detect fluctuation. The lameness is so intense that one may suspect a broken bone. Animals usually refuse to stand and groan continuously with pain. The temperature is increased 2-3 degrees and the pulse hard and wiry, with increased frequency. Appetite and rumination are suppressed, muzzle dry, defecation delayed, milk secretion decreased and animals emaciate rapidly. Peculiar complications are seen; *i. e.*, acute endocarditis, leading in not a few cases to death.

Pleuritis, peritonitis, pericarditis, laryngitis and inflammation of tendon sheaths. Urticaria, as seen in man, may be a sequel and is likely due to the infectious agent.

Course.—Usually chronic, rarely acute, though cases of re-

covery in two weeks have been noted. Cure is often only apparent, relapses are common and metastasis is frequent. By far the most cases take a chronic course and the outlook is unfavorable, though the systemic affections may soon leave. Digestive disorders prevail in most cases and often a severe diarrhoea is the conducive cause of death. The surrounding muscles atrophy, joints become distorted and usually remain permanently thickened. We must distinguish articular rheumatism from traumatic and pyemic arthritis and meningitis where the vertebral articulations are involved.

Treatment.—Since we do not know the infectious agent we should remove the most predisposing factor, namely, chill. In cattle an early removal of the afterbirth and thorough disinfection should be practiced. Internally we can administer any of the drugs recommended for the muscular form; *i. e.*, salicylic acid, salicylate of soda, salol, aspirin, antipyrine, acetanilid, etc. Antifebrin has of late given good results and is by far the cheapest drug at our disposal; for cattle give it in ℥ss to i℥ doses T. D. Laxatives and tartar emetic should be resorted to for absorbing exudates and carrying off infectious material. Potassium iodide as a resorbent is of value and to render it less expensive combine it with resublimed iodine 2-3. External applications are valuable; *i. e.*, warm packs and bandages about the affected joints after thoroughly rubbing in some ointment; *i. e.*, gray mercury, phenol, iodoform, camphor, etc. In chronic enlargements of joints sharp inunctions are of value; *i. e.* cantharides ungt., tincture of iodine or iodide of mercury. Rheumatic phylacogens have been used with varying success, but until we are more familiar with the causative agent our success with biological products will be unsatisfactory.

FINDS IT A GOOD MEDIUM TO GET IN TOUCH WITH VETERINARIANS ALL OVER THE COUNTRY.—Again an advertiser writes in renewing contract for another year: "We are pleased to advise you that we wish you to continue our advertisement in your REVIEW for another year. We find your journal a good medium to get in touch with veterinarians all over the country; we are continually getting inquiries."

TETANUS TREATED PRACTICALLY.*

By D. D. LeFevre, D.V.M., Newark, N. Y.

While at Ithaca a few days ago, attending the veterinary conference, I had a talk with some of the leading veterinarians of the state and also with several members of the faculty of our own state college. We discussed the question of the high price that we are obliged to pay for tetanus anti-toxin, a remedy which you will undoubtedly concede possesses a high value therapeutically.

Professor Moore said that he was of the opinion that there was very little tetanus in this state. I replied to him that I believed that there was a considerable amount of tetanus, but not much anti-toxin used, because our patients were not valuable enough to warrant the purchasing of anti-toxin at present prices. He, in turn, replied something like the fellow from Missouri, that "I would have to show him," and said that if it could be shown that it was true that we did have considerable tetanus and that anti-toxin was too high for practical use, that it could be put before the State Board of Health and it was quite possible that the State Board of Health might take it upon itself to furnish us with anti-toxin at cost, the same as they furnish it to the M.Ds. Therefore, I have provided the cards which are being passed around so as to be able to have some data. I trust that you will each fill out one of these cards.

As you all know at the present time for $2.00 we get from any of the firms a wooden box covered with nice smooth paper, two or three pieces of cardboard, two glass retainers, some rubber caps, tubes and other little digaflitters for good measure, and seven drams of anti-toxin; mind you, seven drams, not eight, and said to be three thousand units. Upon reading the direc-

* Read before The Genesee Valley Veterinary Society at its Semi-Annual Meeting at Rochester, N. Y., January, 1912.

tions upon the paper, we are told to use as the smallest dose that we may expect any results from at least ten thousand to fifty thousand units, or, in other words, from three and one-third boxes to sixteen of these boxes at one dose. Why a man would want a corn basket to carry them along in! Or, if you take a look at the pocket-book side of the question, it says as the smallest possible dose give nine dollars to thirty dollars' worth at one dose, and must be repeated every four or eight hours; that is, from fifty-four to one hundred eighty dollars per day of twenty-four hours. I tell you at that rate the drug companies have got you going some. That's kind of reaching it under the leather a little, don't you think it? Did you ever try it? Oh, of course, you have had some cases get well by letting a horse look at a box or two, and so have I had some fine recoveries from caramel and water.

But the fact remains that anti-toxin has been tried out on experimental cases of tetanus at the drug companies' laboratories and to obtain any kind of positive or uniform results the dose recommended by these companies is not too large, but is, as they say, the smallest advisable dose, except as I will attempt to show in this paper that part of the anti-toxin may be displaced by the adoption into the treatment of other methods; in fact, I am not here to give you some new specific or cure-all for this disease, but rather to emphasize the importance of a very, very old, yes, almost forgotten treatment, *viz.*, the practice of bleeding, assisted by some of the more recent therapeutic agents, such as anti-toxin, carbolic acid and other agents.

The history, etiology and morphology are so familiar to you all that it would be useless for me to dwell upon them, so I will immediately proceed to the question of treatment, and, as bleeding in my practice come first, we will talk of that.

You may ask "Why should we bleed?" To explain, let us go to the most plausible theory of toxins and anti-toxins. The theory which I believe is now universally accepted, *viz.*, Ehrlich's side-chain theory. Perhaps every one here is perfectly familiar with it, and perhaps others have been so busy

with their various duties as practitioners that they may not have become thoroughly acquainted with the particulars of this theory. Bleeding is based upon this theory, so to understand why we bleed we must first understand the theory. Therefore, I have copied these drawings* from the AMERICAN VETERINARY REVIEW and will proceed to explain them and at the same time show where the good from bleeding comes in.

According to Ehrlich, every toxin has affinities, described as heptophorous and toxophorous, that is, every molecule of the toxin is composed of two different groups of atoms, one of the toxophore or poisonous group, and the other of heptophore or combining group. The heptophorous group of the toxin combines or unites with the receptors of the cells for which they have a special affinity, and the toxophorous part of the molecule is thus enabled to pass through the heptophorous group into the cell upon which it acts.

Ehrlich says, "Sometimes it destroys the cells, sometimes it *stimulates* the cell to throw out additional receptors; the cell may have become stimulated to such an extent as to throw off free receptors, which are then called anti-toxin. If enough of these free receptors are thrown off into the blood to completely take up or unite with all the poisonous constitutents in the blood then the disease is overcome."

Now in a horse suffering from tetanus we have reason to believe that the toxin has combined with and taken up all the receptors fast or free and is grasping every new receptor as fast as they are thrown out, and we also have reason to believe that most of the existing cells have been stimulated to their limit of manufacturing receptors, and yet we haven't enough receptors; also many cells may have produced all the receptors that they can produce, and now are inert, so far as fighting the disease is concerned. Many may now be dead or nearly so, and waiting to be eliminated. I believe that many are being killed,

* Not shown—may be found on pages 688, 689, 690, September, 1911, AMERICAN VETERINARY REVIEW.

especially at the stage where the disease is overcoming the animal. So much for the old cells. Now about the new ones.

During the progress of, and directly after recovery from a disease to which immunity is acquired, nature, through an obscure power, endows the new cells, which at that time are being formed with a far higher fighting power, or, if you please, with a far higher power of reacting to the stimulation of uniting toxins and producing receptors for that particular disease, as described by Ehrlich, and so long as the cells retain this acquired power of producing this large amount of receptors the individual remains immune to that particular disease.

Now if we bleed such a horse, one whose blood is filled with toxins, dead cells and inert bodies, such as combined toxins and antitoxins, say we take away one-half the blood (Smith's physiology, page 20, says a horse has about twenty-five quarts of blood). I have frequently bleed fourteen quarts from an ordinary farm horse, probably of fourteen hundred pounds. So say we take half the horse's blood, there is one-half of the free toxins gone that will not need to be neutralized, a thing of great importance, besides one-half of the dead cells and inert bodies. Now if we give our antitoxin we get just as much good from one-half of the dose, or twice as much good from the full dose, but what is more important than that, while the horse is in the violent throes of this disease, the taking away of such a large portion of blood is going to set Nature to work, making new blood cells at an enormous rate, and, as just explained, Nature sees to it that every new cell now formed is endowed with a far higher power of fighting this disease than any of its predecessors had, which were formed before the advent into the system of this disease, and so long as this disease is present in the animal every time you bleed you are going to get a new crop of cells, possessing a stronger and stronger power to produce receptors for the toxins of this particular disease, or any other disease which may be present in the system to which immunity may be acquired. I have found bleeding of very great aid in some very bad cases of strangles.

You who have not tried bleeding the horse afflicted with tetanus probably think it is a very simple job. Well now just get that out of your head at once. The easy bleeding, mind you, easy *full bleeding* to the limit of a nervous horse afflicted with such a nervous disease as tetanus requires no small amount of skill and headwork. First, there is something about a tetanus horse that seems to hinder an ordinary fleam from opening the jugular. In early days I have frequently had occasion to snap this most excellent spring fleam a number of times to even start the blood, and then when part of enough blood had been drawn it would stop running and the same performance would have to be gone over again. Sometimes the fleam would have to be brought into use three or four times in order to extract a sufficient amount of blood, and perhaps by that time the horse had become thoroughly excited, probably unmanageable, so first thing cast aside all your fleams; also you will find that the blood flowing with noise into a metal pail excites the animal, so provide the assistant with a pail into which has been placed a board or shingle standing on its end, so that the blood may strike it slantingly and noiselessly; have assistant stand on left side of horse, his life hand on the halter, and hold the pail in his right hand on his right knee; clip hair from right jugular, place your left finger on jugular so as to make it fill, then with *castrating knife* plunge into jugular and cut up and out quickly. Make a large free opening so as to get a stream of blood as big as your finger. The hole will close up quick enough. In all my bleeding I have never been able to get one too big, and I dare say that I am as bold with the knife as most of you. Keep the fingers on the jugular so as to keep a good big free stream flowing. Get the blood out of the horse as quick as you can. When you are partly through, should the animal become considerably excited, quit for a few minutes, remove fingers from the jugular and if you keep the head elevated blood will not flow through the wound, and if you have at the start made a good free opening, it will immediately start when you again block the jugular. One may stop when he feels the pulse become irregular, possibly in-

termitting, but I find that one can nearly always safely draw one quart of blood to every one hundred pounds of horse flesh or thereabouts; but you should learn to judge the pulse. I generally repeat the bleeding on the third or fourth day, according as to how dangerous the horse is, and give the antitoxin immediately after each bleeding, and find that I get at least twice as much action from the antitoxin and gain natural immunity very rapidly.

JOHN V. NEWTON, COUNTY TREASURER.—Buckeye State men and A. V. M. A. members recognize in this strong, handsome face, that of Dr. John V. Newton, of Toledo, Ohio, late president of the Northwestern Ohio Veterinary Medical Association. Dr. Newton, who is an old A. V. M. A. member, was elected County Treasurer at the fall election, on the Progressive ticket. Some of the doctor's views on ventilation and bovine tuberculosis are published on page 117 of this issue.

THE BUREAU OF FARMERS' INSTITUTES held a three days' session called "Farmers' Days" at Saratoga Springs, N. Y., March 18, 19 and 20. The program shows the three days were filled with the presentation and discussion of matters of interest to agriculturists. The first day was designated "Fertility Day," and was devoted to the discussion of the care and fertilization of the soil. The second was known as "Live Stock Day," including a "Special Poultry Session." Live Stock Day was an especially interesting and instructive one, including "Essential Points in a Good Dairy Cow," illustrated with living animals; "Intelligent and Economic Feeding"; "Swine," by Commissioner Huson; demonstration of "Essential Points in a Good Horse," illustrated with living animal; "Diseases of Domestic Animals," Dr. De Vine, and "Slaughter of Reactors to Tuberculin Test"; "Tuberculosis as a Rural Problem," etc., etc. The session on poultry was also very full and carefully and intelligently handled. The third day was given to a "Special Women's Session," and was also designated "Crop and Fruit Day," covering such questions as corn, alfalfa, spraying problems, etc. Altogether it was a highly educational convention.

FOLLICULAR MANGE.*

By C. G. Rohrer, D.V.S., New York, N. Y.

This disease is most commonly found in the dog, but may be found in the cat, horse, pig, sheep, ox, wolf and the rat. In rare cases it has been found in man.

History.—Follicular mange is caused by a parasite called the sac-mite, hair-sac mite, acarus follicularum or demodex follicularum and belongs to the group of arthropodes (articulated animals). It was first discovered by Henle and Simon in 1843 in man, and later in the same year by Tulk on dogs. Since then the following varieties have become known: Acarus follicularum, canis, cati, suis, bovis and hominis. In its fully developed state the body of the demodex follicularum of dogs is worm-shaped and lancet-like. In the pig and cattle it resembles more the form of a laurel-leaf.

It is about 1/75 to 1/100 of an inch long and narrow, and is divided into three segments, head, thorax and abdomen. The thorax and abdomen are joined as one piece. The head is horseshoe-shaped and consists of an upper and lower jaw and a number of movable feelers and two eyes. The thorax is short and has on its two free edges four pairs of movable limbs. The abdomen is long and pointed behind, being transversely striated. At its interior portion it shows a longitudinal slit which is the aus. This slit is larger in the female than the male and probably serves for copulation and ovulation.

The young demodex has only three pairs of legs, is smaller and narrower, and has no rings around its abdomen and is hatched from spindle-shaped or oval ova, or eggs. The females lay from twenty to twenty-four eggs at once, which hatch out in from four to seven days into larva, which after

* Presented to the February meeting of the Veterinary Medical Association of New York City.

three or four changes of skin are capable of reproduction in from fourteen to seventeen days.

The females die in from three to five weeks after laying the eggs. The males live to be about six weeks old. The eggs will keep for two to four weeks on a moist surface and on a dry one from four to six days. The mites can exist isolated in moist air or on moist dung, etc., for from six to eight weeks; on dry surfaces for from one to four weeks. They pass through three stages of skin formation before reaching maturity. From the eggs issues a larval hexapod, the legs of which represent three pairs, and the buccal organs are yet in a rudimentary condition. After a moulting the larva becomes an octoped; the fourth pair of legs appear, but being still small like the other three pairs, a second moulting transforms this larval octoped into a nympha, which possesses the legs and buccal organs of the perfect state, from which it only differs in the absence of sexual organs, in the male the acquisition of these being the result of a last transformation. The female demodex is larger than the male and more numerous. The male also seems to live a different life, being more in exile.

Symptoms.—This disease presents itself under different conditions and aspects according to the duration, the species affected and treatment given before the veterinarian is called in. Some authors divide this disease into three forms; namely, *Squamous, Circinated* and *Pustular.*

The commencement of the disease commonly occurs about the head and shoulders or paws of the animal, rarely on the broad of the back and on the under surfaces of the body. It is usually first noticed by the hair falling out over a small area which at first shows no sign of an irritation. It usually is left alone and gradually other patches appear. These bald or near hairless patches many times have a blue or purplish appearance, usually dry with a scruff or scaly appearance. The skin becomes thickened and indurated with small pimples or papules appearing. The papules become larger and take on a purple center and are often broken by scratching, after which they

discharge a mucinous sticky matter. This process continues until the entire body is covered with pustules and a very thick skin which folds up and emits a sour fetid odor. At this stage of the disease the animal becomes emaciated and may have a profound effect upon the whole organism. The appetite which has been usually very good is now lost and the animal presents a pitiable sight.

The Squamous form is described as one might describe the early stages of the disease where the skin has taken on the blue or purplish appearance over small or large areas with the loss of hair and a dry scaly appearance shedding an abundance of epidermic pellicles. There is no humidity and little if any trace of inflammation and usually difficult to diagnose.

The Circinated form is described or characterized as being more generalized and the lesions taking on circumscribed or circular areas may be mistaken for ringworms. These areas take on an irritated appearance having innumerable pustules which often coalesce, forming nasty looking purulent patches devoid of hairs. This form causes the animal to scratch considerably.

The Pustula form is usually found in the more advanced stages of the disease where the whole or nearly the whole part of the body is affected. The hair has all fallen out, the skin is very thick and rolled upon itself with innumerable pustules found on all parts of the body. The animal is usually emaciated and often exhausted by the continued scratching. This form of mange responds to treatment more readily than the other forms, unless it has progressed too far.

Diagnosis and Differential Diagnosis.—This disease can only be positively diagnosed by the microscope. This is done by scraping the skin over the affected parts until it bleeds or the contents of the pustules pressed out. A smear is made on a glass slide and the demodex can be found with a low power lens.

The circinated form may easily be mistaken for ringworms, but here the presence of the *Tenia tonsorans* and the

absence of the demodex will decide the malady. This disease may be mistaken for what is known as red mange or "Rouge," which appears in young and old dogs, but which instead of commencing on head or paws begins on the under part of the body, the inner surface of thighs and armpits and is non-parasitic. This reddened condition of skin emits a sticky discharge which causes artificial lesions as a consequence of the rubbing and scratching of the animal.

This disease may be mistaken for "Sarcoptic Mange," but here again the microscope will aid the veterinarian. Sarcoptic mange is caused by the "*Sarcoptes*," which has a different conformation than the demodex. It is accompanied by more scratching and the papules are on the surface of the skin and take on a reddish appearance.

Non-parasitic acne and furumculosis may be mistaken for follicular mange, but here again the microscope will help you.

Pathology.—The prominent feature in the pathology of this affection is the presence of the *Demodex follicularum* in the hair follicles and sebaceous glands, particularly in the hair follicles where they are found in considerable numbers.

Some investigators have counted as many as two hundred in one follicle. Here they are found in all stages of development, from eggs to the sexualized individuals and fecundated females. By their presence they cause an irritation of variable intensity according to their numbers and activity. When the inflammation is acute it invades the tissue of the derma and causes the formation of the pustules. At other times there is merely hypersecretion of sebaceous matter which dilates the canal of the follicle. The parasites, when they have been for some time in their first location, pass through the walls into the derma and subcutaneous connective tissues, causing an inflammation of the skin and the pustules on the surface and sometimes small abcesses. The shedding of the hairs is due to the proliferation of cells on the inner surface of the follicle and softening of their base. Relapses of the disease may be due to some of the parasites

which become encisted and which have again broken down the new walls of the hair follicles.

Treatment.—Every known parasiticide substance has been tried for the cure of this disease with just as varied results. Owing to the fact that the disease spreads very slowly, and many times is not properly diagnosed, it becomes generalized and in some instances almost incurable. Again, the parasites being so deeply situated has much to do with the cure. Some investigators pronounce the disease as absolutely incurable, while others find it comparatively easy, but always mention the fact that it takes weeks and sometimes months to effect a cure. Follicular mange can be cured and is being cured every day, but a few prominent factors must always be taken into consideration.

The General Health of the Animal Affected.—The amount of money to be spent to effect a cure. Patience and hard work combined with good common sense. Cases that are not in the advanced stage or new cases respond to treatment readily in from three to five weeks, others may take from six to twelve weeks, depending on the physical condition of the animal.

The first step taken usually is the clipping of the hair over the entire body. This will expose all the affected parts. Washing and thorough scrubbing with a brush will remove the scales and discharge, if any, from the skin. Caustic soda may be employed in these baths. Sulphuretted potash is used by some to dissolve the crusts with good results. The application of the different ointments and mange cures, parasiticides, etc., are applied by thorough rubbing with frequent baths (to remove the dead derma) must be employed.

Peruvian balsam is used by many, especially when the animal is treated at home. Creolin and bichloride baths are used, but care must be taken when the toxic substance is used to prevent the animal from licking it.

Some of the later methods are the mange vaccines of different varieties. Staphlo bacterins are recommended. Some veterinarians report marked results, others not so good. It is not a question of killing the parasite so much as it is to reach it. The

following list will illustrate the length of time consumed by a few of the medicinal agents employed to destroy the *Demodex* when applied direct.

Cresote, 10 per cent., at once; cresote, 5 per cent., 6 minutes; sublimate, 2 per cent., at once; sublimate, 1 per cent., 15 minutes; creolin, at once; Peruvian balsam, a few minutes; petroleum, 95 minutes; ichthyl, 25 minutes.

In conclusion, would say that owing to the length of time it requires to cure Follicular Mange in the dog, and to the delicate constitution of the inbred animals, it is one of the most vexing and trying diseases the veterinarian meets with in canine practice.

FIFTIETH ANNIVERSARY OF ONTARIO VETERINARY COLLEGE.—The Ontario Veterinary College will celebrate its fiftieth anniversary on April 10. An entertainment will be given in honor of the occasion in Convocation Hall at 8 o'clock in the evening. A cordial invitation is extended to alumni of the college and all interested in veterinary science; and we trust Principal Grange will find himself surrounded by loyal friends and supporters on this memorable occasion.

DR. J. F. DE VINE ADDRESSES FARMERS AT SARATOGA SPRINGS.—At the farmers' day session at Saratoga Springs, March 19, Dr. John F. De Vine, of the New York State Department of Agriculture, gave an address on the "Diseases of Domestic Animals." The doctor also gave a slaughter demonstration, under the direction of the State Department of Agriculture, of animals that had reacted to the tuberculin test and were considered tuberculous. The value of such addresses and demonstrations is incalculable, and much to be commended. This despite the fact that the doctor had officiated as toastmaster at a banquet given in honor of Ireland's Patron Saint at the St. Elmo, Goshen, N. Y., on March 17, while, as expressed by the Goshen *Independent Republican*, "twenty-one of the leading citizens of that city were being served with the best the St. Elmo kitchen could produce, and being waited upon by the St. Elmo's pretty waitresses," whom it described as "dreams of beauty gowned in immaculate white, with green caps and aprons."

CATHETERIZATION OF THE BITCH.*

By Dr. Heinrich Jakob.

This method is resorted to, when owing to the fact, that too scanty a quantity of urine present in the bladder, the same cannot be evacuated by slight pressure with the flat hand against the middle and lower portion of the meso and hypogastrium, or when the epithelium of the diseased bladder shall be treated directly.

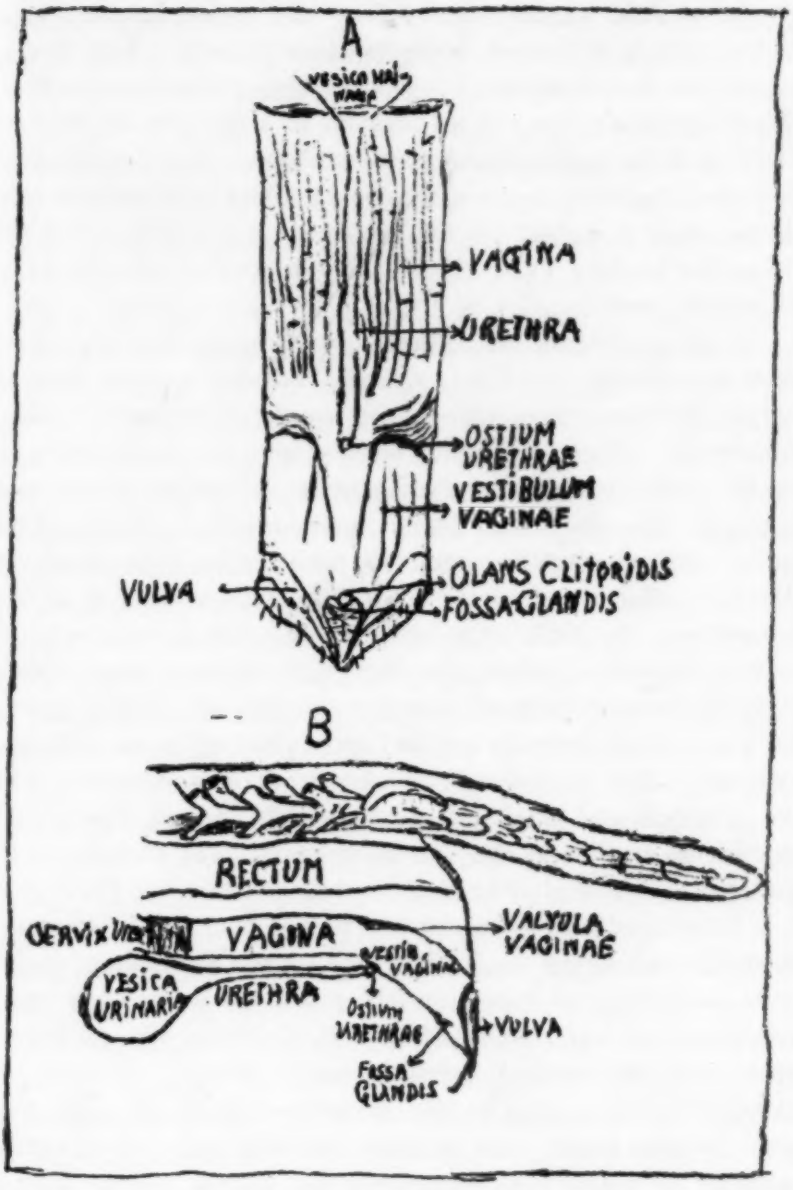
Catheterization of the bitch is usually a very difficult operation. Above all, an exact knowledge of the anatomical relations of the female genital apparatus is absolutely essential.

Figure A represents a longitudinal section from the vulva to the portio vaginalis uteri, and the entire surface of the epithelium is exposed to view. In the region of the lower border of the vulva is an excavation, the fossa glandis (clitoridis). On both sides the latter is bordered by a rather strong duplicature. In the region of the glans clitoridis and beginning about 1 inch from the vulva is a groove of ¼ of an inch in length. The termination of this groove is rather obscure.

In the average sized bitch the vestibulum vaginæ measures about 2.4 inches in diameter. Fig. A shows an elevation in the median line of the lower commissure of the vestibulum vaginæ extending from the glans clitoridis to the valvula vaginæ. Like a wall, this elevation constitutes the division between vagina and vestibulum vaginæ (Fig. B). At the division between the vagina and the vestibulum vaginæ a saculation is found, which at the most is ½ cm. in depth.

In straight direction from the glans clitoridis and perhaps 2.4 inches distant from the vulva is the ostium urethræ, the opening into the urethra, which terminates in the vestibulum vaginæ near the vulvula vaginæ (diff. Fig. B). This orifice is not as small as is usually assumed.

* Translated for the American Veterinary Review by Julius A. Jessen, D.V.M., Irwin, Ia., from Deutsche Therarztl. Wochenschrift, Vol. xx, No. 46, pages 711-714.



Figures A and B.

The urethra, which is separated from the vestibulum vaginæ by the valvula vaginæ, runs below the entire length of the vagina, which in bitches is comparatively long. The urethra constitutes a duct about 3.6 inches long, extending from the ostium urethræ to the vescica urinaria in a straight line and terminating at the cervix uteri into the bladder. The distance from the lips of the vulva to the neck of the bladder is in medium sized bitches about 6 inches. When empty or in a slightly filled condition the bladder (vescica urinaria) is located directly below the cervix uteri.

In catheterization the catheter usually slides over the ostium urethræ, forcing itself through the valvula vaginæ into the vagina and from there into the portio vaginalis uteri (orificum externum). Here it usually strikes upon insurmountable obstacles. By using an elastic catheter the point of the same bends at this place and finally again appears outside of the vulva. When a metal catheter is used the bitch becomes very restless. But the catheter may also slide to one side, thus falling into the little excavation located just posterior to the valvula vaginæ. When this occurs, it becomes impossible to push the catheter forward and the animal fares intense pain.

This may entirely be avoided by proceeding in the following manner: The bitch should be placed on its right side. Then the cleansed and oiled left forefinger is pushed through the vestibulum vaginæ to the valvula vaginæ. The catheter is disinfected and coated over with paraffinum liquid. This done, it is introduced into the vulva and passed over the fossa glandis clitoridis and along the median line of the vestibulum vaginæ. By introducing the finger into the vulva the way to the vagina is almost entirely obstructed, which facilitates the catheter to glide into the ostium urethræ much easier. Besides, the catheter can be guided to the ostium urethræ in straight direction by the finger, and it thus becomes easy to determine, whether or not it has passed over the valvula vaginæ into the vagina. Should this occur, the catheter is withdrawn a few inches.

In bitches having a very large vulva, one may hold the same open with the thumb and middle finger, while the forefinger is pushed forward to the ostium urethræ, and slightly bent so as to draw the entire vulva somewhat backwards. By this means the ostium urethræ is brought nearer to the exterior, and a catheter which is inserted in a straight line with the axis of the body can be passed through the urethræ without much difficulty. In this case the straight elastic or metal catheters are preferred.

In small bitches it is impossible to push the finger as far as to the valvula vaginæ. Here the thumb and forefinger are placed in the vulva by which means the same is slightly drawn backwards. Then, the catheter is inserted in an almost straight line with the axis of the body and directly forwards. If a slight pressure be exerted upon the valvula vaginæ from without, the catheter may thus be prevented from passing into the vagina.

Most bitches resist the use of a speculum. The elastic catheters deserve the preference over the metal catheters, while sharply bent catheters should be rejected. Easily bent or straight catheters are most highly recommended.

After catheterization the elastic catheter is rinsed with very warm water for about one minute and hereupon with a 70 to 80 per cent. solution of alcohol. Then, after it is thoroughly dried with a sterile cloth, the catheter is placed in a sealed glass-cylinder in the bottom of which lie two to three lozenges of formalin. In observing these precautions the catheters are always ready for use.

In catarrh of the bladder or intense inflammation of the same, where local treatment of the epithelium must be resorted to, the evacuation of the urine by use of a catheter may be followed by an irrigation with boiled water, which has been cooled to body-temperature. This is best done in conjunction with an infusion and should be repeated until the evacuated water appears clear. Then the bladder should finally be irrigated with a solution to which a good antiseptic and astringent has been added.

MISTAKES IN EVERYDAY PRACTICE.*

By Dr. F. E. Anderson, Findlay, Ohio.

Your honorable and worthy president in assigning a subject to me knew whereof he spoke when he said "Mistakes in Everyday Practice," a subject which I know you have had much experience in, mistakes every day.

As I have been practicing up to date 9,730 days you will readily see it will take me some time to relate all of them to you, as some days there might have been more than one. Now, gentlemen, the writer, in order to show he is not altogether to blame for this great number of errors, will begin by relating a few occurrences that took place early in life, before he even thought of being a veterinarian, for, as my best recollection serves me, my first and greatest mistake occurred in 1864, April 1. The next very painful mishap that my early recollection serves me with was at about the age of four years, when my inclination to study anatomy got the better of me and the start in dissection was begun by cutting a bumble-bee in cross-section, and for fear of getting bitten (knowing well at that age how severe the bite of a bumble-bee was) I decided to go farther with the posterior end of the bumble and picked it up—you know the rest.

About this time in my life was when the writer first discovered what too much salt would do to hogs. When my father left me to watch a sack of the now chloride of sodium while he was absent for a few moments I was like Jimmie watching the baby. Something attracted my attention and my father got back about the same time I did and ten big hogs got at that salt, something they evidently had not had for some time (maybe never), and had ripped the sack into strips and eaten enough salt to kill three or four of them. I think if my father had not been so fat he would have been whipping me yet.

In 1884, I started to Toronto, Canada, to enter veterinary school. I was 20 years old; took my first sleeper at Toledo and

* Presented to the Northwestern Ohio Veterinary Medical Association, February, 1913.

woke up on board the ferry crossing the river at Detroit into Canada, heard the rushing water and thought my time had come. Had an uneventful time until 1886 when I graduated and returned home, feeling I had the bull by the horns. A few days later was called to see a colt with an abscess at the umbilicus, discharging foecal matter; operated at once; peritonitis set in promptly, tried to quiet pain with morphine because was taught that it was the real thing, gave about 40 grains in 12 hours; effect; colt walked a circle until death.

Mistake in operation technique, also in giving morphine. Shortly after this was called one Sunday morning by a preacher to see a Jersey heifer due to calve, with prolapsed vagina and rigid os exposed. Split the os three ways, delivered the calf and killed the heifer. Have not repeated that technique since. Next was called to see a fine big mare which could not give birth to colt. The doctor was short of arm and experience, gave chloroform as anesthetic, delivered colt, gave ergot to cause contraction of uterus, which expelled same promptly, causing death at once.

Difficult parturition No. 2, worked six hours trying to deliver without using embryotomy knife, sent for an old castrator big as a giant, who said he never failed. He worked three hours and failed. The owner then consented to let me use the knife which removed the fitus in a couple of hours. Mare died next day from metroperitonitis. Should have used knife early and saved the mare.

Brown gelding, worth $250, water seed one side, operated standing in field. Made good incision, water escaped, also about a foot of omentum, cut that off with ecrasure, led horse to barn when another foot protruded, amputated that same way and put stitch in scrotum, called back next morning, made examination per rectum and found loup of small intestine in inguinal ring which had become strangulated, caused very painful death, both to owner and doctor, not saying anything about the animal.

In 1886 castrated 100 colts for $1.00 each, too cheap. My first case of azoturia recovered, treated the symptoms; took me

three days to find out what the trouble was. January 4, 1887, moved to my present location, Findlay, Ohio, where, no doubt, the mistakes that have been made in the 26 years have been many and varied. I will try to name a few of the most important ones without trying to describe them here, but will be glad to go into detail on any of them in discussion if any one is interested to know the outcome. In 1887, went into the training business as a side line; fatal termination. Discovered a case of glanders (brick yard mule) and lost business of the firm. 1888, Bought a livery stable on wind. 1889, Invested $2,500 borrowed money in a glass factory; No. 23 skiddo $2,500. 1890, Sold livery stable bought on wind (no mistake). Called Dr. J. V. Newton in consultation (A. M. Gordon's mare), serious mistake. Giving a horse a dose of arecoline, that was doing all right; death from ruptured bowels. Ordered a mare shot, think she had extra uterian conception; big mistake. Killed cow with a douche tube; big mistake. Expert opinion on colt struck by lightning? Putting azoturia horse in sling; another big mistake. Giving stallion ezerine; serious big mistake. Giving remedy to increase peristalsis when animal is tympanitic. Diaphragmatic rupture. Operation without using autetanic serum. Over-dressing a horse's mouth; my first. Mistake to remove molar in most cases of ulceration. Mistake in firing spavin with horse cast. Mistake to try to save horse with traumatic pneumonia. Diagnosed acute indigestion; blk. colt died 18 hours later, found abscess from strangles.

Ralph Waldo Wine said: "The past is of value only by way of lessons it has brought us. There should be no regrets or crippled energies that result from such. We have stumbled, all have stumbled."

Dr. G. W. Butler Transferred to Indianapolis.—Dr. G. W. Butler, B. A. I., stationed at Lafayette, Ind., was transferred to Indianapolis March 1, and made inspector in charge at that station. We congratulate the doctor on this mark of recognition from his chief.

A REPORT ON EQUINE FILARIASIS.

By Chas. F. Harrington, M.D.C., Veterinarian Quartermaster Corps, U. S. Army, Camp Overton, Mindanao, P. I.

While engaged in some work for the civil government of the Philippine Islands, I examined a large number of native ponies and one Australian horse. My first impression, from the clinical aspects, was that I was dealing with surra, for there were many symptoms of that disease, such as swelling of the dependent parts, knuckling of the fetlocks, etc. Upon microscopical examination I was, for a moment, strengthened in that diagnosis. Under the two-thirds power objective the movements among the red-blood cells somewhat resembled that caused by the Trip. Evansi, although exaggerated; the one-sixth power, however, soon disillusioned me, and I found I was dealing with the larval form of filariæ. To make sure of this I mounted and stained a specimen and sent it to the Biological Laboratory at Manila, P. I.; my diagnosis was correct.

I then obtained permission to experiment on an American horse belonging to the Quartermaster Department, U. S. Army, my idea being to determine whether or not the parasite could be transmitted from one animal to another by blood-sucking insects. I took from the jugular vein of an infected pony about 30 c.c. of blood, verified the presence of the parasite, then injected 10 c.c. subcutaneously into the test horse.

A careful temperature record was kept, also frequent microscopical examinations were made; but there was no rise in temperature nor could I at any time demonstrate the presence of the parasite. Then I injected 10 c.c. of the infected blood directly into the jugular vein of the test animal, and a temperature record and microscopical examinations were carried out as in the first test. Every test was negative, and there was

no rise in temperature. Each of these tests was carried over the period of a month.

The parasite in the fresh blood has a squirming, twisting motion with but little progress in a given direction, and is easily found under the 16 m.m. power. There was always a greater number per drop of blood when the specimen was taken from the jugular, but the parasite was always demonstrable in specimens of blood taken from the tip of the ear, puncture of the nose, and from incisions made in the skin at any part of the body. I counted as many parasites as ten to a very small drop of blood taken from the jugular, but the average from different parts of the body was not over five to the drop.

I found the parasite in seven native ponies and in one Australian horse belonging to one man. Later, I operated on an American horse also belonging to the same man, for a filaria in the anterior chamber of the eye, but I do not know whether this was the adult form of the parasite found in the blood. All the animals were in very poor condition, but that is so common here that it could not be taken into consideration. They were all on low ground, but not wet, and it was just at the end of an unusually long drought. The first time I found the parasite was about the middle of June, 1912, and the parasite was still demonstrable the last of September.

I submit this report with the hope of starting a discussion and possibly throwing more light on the subject. In my search through such literature as is available I have not been able to find many reports on equine filariasis. True, every author on parasitology speaks, in an indefinite way, of filaria inhabiting the blood stream, but specifically reported cases I find are rare. Law, in his revised work, mentions several species; a French veterinarian, Capt. Darmagnac, mentions a case that resembled dourine; and that is about all the literature I can find on the subject.

I went into this subject quite thoroughly and reported my findings to the Quartermaster Department, U. S. Army, with the idea of preventing some of the quacks employed in that

department from killing animals so affected, mistaking it for surra.

Although I did not arrive at any definite conclusions as to the species of this filaria, I think I have successfully demonstrated the fact that it was in an immature form, and that it cannot be transmitted from one animal to another through the bite of blood-sucking insects, because it did not multiply when injected directly into the blood stream nor when injected subcutaneously; and also that it is not transient.

From the fact that the parasites steadily increased in number, and that I found no mature form in the blood stream, I concluded that the larval form was passing to the blood from the intestinal tract or from a mature form located in some other tissue of the body.

DR. J. G. RUTHERFORD AGAIN HONORED BY HIS PROFESSIONAL BROTHERS.—Dr. J. G. Rutherford, former veterinary director general of Canada, now chief of the Animal Husbandry Branch of the Department of Natural Resources, Canadian Pacific Railway Company, with headquarters at Calgary, Alberta, was banqueted by the British Columbia Veterinary Association, at Vancouver, B. C., on January 30. Over one hundred were gathered around the festive board, including a few from across the border in Washington State and Wisconsin. In responding to the toast "Our Guest," Dr. Rutherford made one of his usual excellent addresses, in which he reviewed the agricultural conditions and possibilities in the Canadian Northwest, of which he seems to have a very clear and concise idea. Both he and the Deputy Minister of Agriculture referred to the useful assistance in furthering the live stock industry rendered by the British Columbia Veterinary Association.

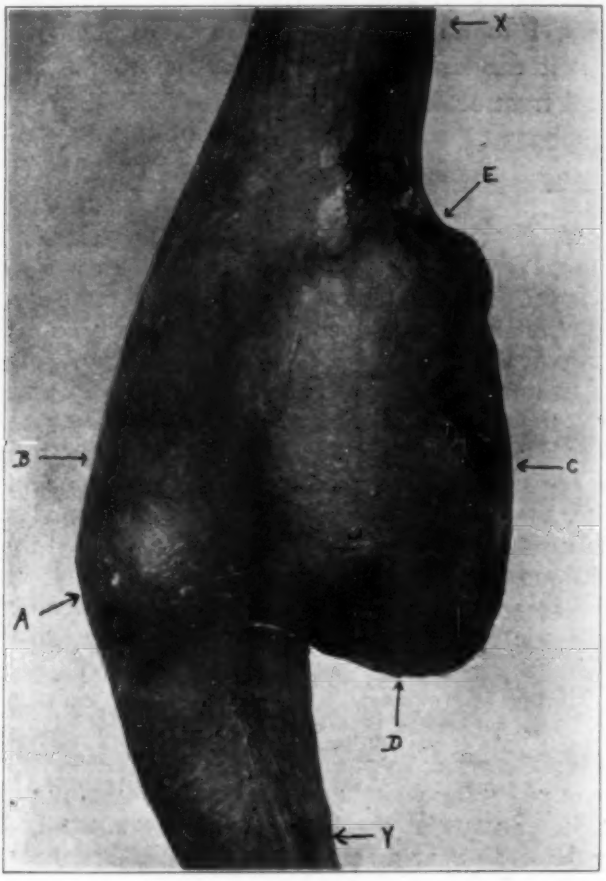
LIKES IT BETTER AFTER FIFTEEN YEARS.—A Tennessee subscriber in renewing writes: "I don't see how any practitioner could get along without the AMERICAN VETERINARY REVIEW; this is my fifteenth year and I like it better all the time. I have all my numbers in bindings, which I have for reference just the same as text-books, only I get more information from them than from my text-books."

REPORTS OF CASES.

JABOT IN A HORSE.

By J. A. De Groodt, House Surgeon, New York-American Veterinary College, New York, N. Y.

On Tuesday, February 11, this gelding was presented to the "American Veterinary Hospital" for treatment, with a history that since the Saturday preceding, it had been unable to swallow;



X = superior portion; Y = inferior portion; BC = its greatest transverse circumference, which is 10⅜ inches; DE = its greatest longitudinal circumference, which is 10⅝ inches; A = smaller dilatation.

also, that for some time prior to this, when drinking, he would act as if he were choked, then cough and regurgitate a large quantity of water.

The following symptoms presented themselves: At about the upper part of the lower third of the dorsal portion of the œsophagus was a balloon-like swelling which, when pressure was applied to it, caused a fluid with a sour odor to pass out through the nostrils. When water was offered to him he would go at it greedily, only to cough and regurgitate after taking a swallow or two; he would refuse food of all kinds.

A diagnosis of a jabot was made.

As the animal was in such a weakened condition, due to want of nourishment, an operation was considered unfavorable. Upon the following night the animal died.

Upon post mortem it was found that the diagnosis made was correct, and in the said region a jabot, a picture of which is enclosed, was found. When the thoracic cavity was opened it was found that the lungs were in a gangrenous condition; so, also, was the trachea, due to the inhalation of said fluid.

CONGENITAL GOITRE OF THE DOG.*

By Anton Loken, Konigsberg, Germany.

According to Prof. Kitt, struma occurs mostly in dogs, sheep and goats, sometimes in horses, but seldom in cattle and cats. In the district Konigsberg the most cases of struma are met with among calves and horses. In the former the goitre is always inherited, and as a rule disappears in the first year of life. In the adult animals the gland can be felt only with difficulty or even not at all. Also in slaughtered animals no microscopic change of the gland is found. Congenital goitre is at times also met with in colts, but in general, changes in the size of the gland can be traced to hypertrophy and other diseased changes, as cysts, adenomata, and carcinomata, mostly found in older horses and among these usually in geldings. Among hogs and sheep the author has observed only singular cases of struma, but for a while never in dogs. The first cases among these animals therefore created great interest.

The patient in question was an unusually fat dog with a

* Translated for the American Veterinary Review by Julius A. Jessen, D.V.M., Irwin, Iowa, from Norsk Veterinaer Tidsskrift xxlll, Arg., No. 16, Oct. 1911, pages 274-277.

small, plump head, remarkably short legs and having a large collar-like goitre. This was double-sided, and each gland was as large as a hen-egg. The dog was a lively little creature and would occassionally run around barking happily, but soon drop flat upon its side, apparently suffering greatly from suffocation.

Three months later it was again seen by the author; it had grown considerably, being about 10½ inches tall. But the struma had also grown and the glands on both sides were perhaps of the size of a goose-egg. The dog was very lively, but still showed difficulties in respiration. The heart-beat was 144 to 150 per minute, the arteries of the throat were pushed aside at the seat of the goitre as could be plainly felt upon manipulation. They were greatly distended, and the pulse-beat of the carotid artery could be observed at a distance.

Following the administration of potassium iodide the goitre seemed to gradually disappear. The thyroid gland of the now seven months' old animal was not much larger than a small hen-egg, and the animal seemed to develop better. Nothing definite can be said regarding the cause of the condition. Out of the same litter, consisting of five, three were affected with inherited struma.

SOME SURGICAL CASES ILLUSTRATING THE USE OF CANNABIS AS A GENERAL ANAESTHETIC.

FROM SURGICAL CLINIC—NEW YORK-AMERICAN VETERINARY COLLEGE.

During the month of February it was our privilege to happen in at the surgical clinic at the New York-American Veterinary College, when the following operations were being performed by Prof. H. D. Gill, of the chair of surgery of that institution. These operations were performed without table or stocks, to demonstrate to the students how to do them in country practice, on a farm or wherever they might meet them, without the modern hospital facilities.

Case I—Roarer: A black gelding weighing about 900 pounds. He was given 10 c.c. of the filtered fluid extract of cannabis Americana in the jugular, and in a few minutes got sleepy and let himself down onto the bed of straw that had been prepared for him, and was soon in a profound sleep. He was turned upon his back and held in position between two

bales of straw; codrennen was injected and the operation proceeded with, the animal being unconscious of what was going on, and therefore in excellent condition to operate upon.

Case II—Ovariotomy: This mare weighed about 1,000 pounds. Was put in slings; 10 c.c. of the filtered fluid extract of cannabis Americana given in the jugular as in the preceding case, and it was only a matter of a few minutes before she was asleep in the slings. The operation through the vagina was proceeded with, and the mare seemed oblivious to the situation —only raising one hind foot slightly, once during the operation.

Case III—Cryptorchid: This horse weighed about 1,100 pounds. The hopples were placed on him, and 15 c.c. of the same preparation of cannabis administered per jugular as in the previous cases. He soon got sleepy and practically lay down of his own accord, when the hopples were tightened up, the horse placed in position, and the operation proceeded with. It seemed in this case, that the cannabis not only kept the horse quiet, but relaxation was so complete that it facilitated this particular operation. The operator explaining the ease with which he reached the testicle. The patients seemed to sleep for about an hour after the completion of the operation; and, while we were not able to observe them afterwards, they were said to be drowsy for the best part of a day. This seemed to us such an easy and safe general anæsthetic for a horse, that we have reported them for the benefit of our readers. We understand that Dr. Gill uses this method continuously in his own practice in all surgical procedures, including the opening of fistulous withers, etc., and hope in the near future to get some reports of cases in which he has used it from his own pen.

THE REPORT OF STATE VETERINARIAN M. RAY POWERS, CLEMSON COLLEGE, S. C., on the state-wide outbreak of hog cholera in that state, showing that this condition in that and neighboring states is largely due to neglect on the part of citizens in not properly disposing of carcasses of diseased hogs, thereby allowing buzzards and dogs to become factors in disseminating the disease, is very interesting and to the point, and is accompanied by a little booklet entitled "What Your Neighbor Says Concerning Anti-Hog Cholera Serum," prepared by the Veterinary Division of Clemson College, which is also very instructive. Its object is to inform the farmers of South Carolina as to the results of the serum prepared by the Veterinary Division, Clemson College.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. Liautard, M.D., V.M.

A Case of Hemorrhagic Septicæmia in a Horse [*Capt. E. S. Gillett, M.R.C.V.S., A.V.C.*].—As such are rarely reported, it may be of interest. *History:* Has been sick for five days with temperature varying between 101° and 102.4°. One afternoon was found staggering, crossing his legs and blowing hard. *Symptoms:* When seen, was found down, unable to rise. Pulse very quick and weak. Temperature, 103°. Conjunctiva rather pale. Extremities cold. Respiration abdominal and jerky. Rectal examination negative. He had struggled at first, trying to rise, and now lays quiet, without groaning. Temperature rose to 105° before death, which took place the same day. *Post Mortem:* Thoracic organs apparently healthy. Small intestine greatly inflamed all its length; it contains yellowish, sticky fluid with stains of blood. Cæcum and colon inflamed. Liver normal. Spleen enlarged. Smears of blood examined showed organisms of pasteurella type, identical with those found in cattle that died from hemorrhagic septicæmia. The mode of infection remained speculative.—(*Journ. of Comp. Path. and Therap.*)

Congenital Defect in Ventricular Septum of the Heart of a Lamb [*A. Leslie Sheather, B.Sc., M.R.C.V.S.*].—It is the second case observed by the author. The specimen was obtained from a ewe lamb, which appeared in perfect health up to the day it died. No special symptoms were observed, except that the animal looked a little dull and refused food. At the post mortem was found a liver twice its normal size, due to very severe chronic venous congestion. Alimentary canal intensely congested. Rumen small and large intestines congested. Pleural cavity full of turbid blood. Pericardium contains about two ounces of clear, straw-colored liquid. In the interauricular septum the foramen ovale is widely open enough to permit the passage of a finger. In the ventricular system there is an elliptical opening situated immediately below the orifice of the

aorta in the left ventricle; it ran transversely and measured 1½ by ½ c.m. It established a free communication between the two ventricles.—(*Ibid.*)

COCAINE AS LOCAL ANESTHESIA IN AMPUTATION OF THE HORSE'S TAIL [*S. J. Motton, M.R.C.V.S.*].—After trying the effect of cocaine in a horse, whose tail had been amputated, by applying a pad of wadding soaked in a 4 per cent. solution before searing the stump and having such a good effect, the author resorted to the subcutaneous injections of 15 minims of 4 per cent. solution at each of four places around the tail and five minutes after operated, the animal evincing no pain. A twitch was kept on the animal's nose. [*For years we know this has been resorted to by many practitioners when this operation is required*—ED.]—(*Vet. Journal.*)

INTERESTING ANEURISM IN A FOAL [*Arthur Routledge, F.R.C.V.S.*].—Six-months-old filly is observed lame, stiff and in pain. She has switching of the tail and attempts to lay down. She passed fæces in small quantity. Her temperature is up to 105.4° F. Mucous membranes injected. She died in a few hours. Post mortem revealed fusiform aneurism of the mesenteric artery in which seventy strongylus armatus were found.—(*Ibid.*)

ENORMOUS OVARIAN TUMOR [*J. A. Jordan, M.R.C.V.S.*].—Record of a very large neoplasm found at the slaughtering of an aged cow, whose body was so broad across that she could not pass through an ordinary doorway. The tumor weighed 370 pounds.—(*Ibid.*)

UNUSUAL FOREIGN BODY IN THE OESOPHAGUS OF A HORSE [*A. E. Roberts, M.R.C.V.S.*].—Young cart gelding showed symptoms of choking. A hard swelling is detected over the œsophagus some 7 or 8 inches down the neck. By palpation and attempts to push the hard substance upwards, the horse coughed and brought up a piece of limestone, weighing two ounces, triangular in shape and measuring 1¾ by 1½ inches. It had a very uneven, jagged surface.—(*Ibid.*)

UNSUSPECTED FRACTURE OF THE ATLAS IN A CAT [*E. B. Reynolds, M.R.C.V.S.*].—Post mortem surprise. One-year-old castrated cat had seven weeks ago an abscess behind the right ear, which was open but never healed entirely. The cat appeared

in good health up to two days ago, when he seemed to have difficulty in standing. He grew worse and was soon in a semi-comatose condition. The fistula of an abscess being still open, it was proved, and on withdrawing the probe a drop of pus with necrotic smell was detected. The cat was destroyed. At the post mortem was found a fracture of the atlas with lesions indicating that it was of old standing; repairing periostitis and necrotic fragments being detected. Suppuration had extended into the vertebral canal and started inflammation. It is peculiar that such fracture could have existed since such time without giving rise to any earlier symptom.—(*Vet. Journal.*)

Carcinoma of the Oesophagus in a Cat [*Prof. Geo. H. Wooldridge, F.R.C.V.S.*].—Female tabby cat had been wasting for some time and is unable to swallow solid food. Examination of the mouth and pharynx shows that they are clear. A probang passed is arrested at the base of the neck. A hard body was felt by manipulation. Oesophagotomy advised and the animal chloroformed. The œsophagus exposed, a new growth was readily observed. It had a broad, diffuse base, and had to be curetted out, when then a probang could readily be passed through the œsophagus. The cat died twenty-four hours later. At the post mortem it was found that the growth was extended within the thoracic portion of the œsophagus. Microscopic examination showed it to be carcinomatous.—(*Ibid.*)

Sarcoma of the Intestinal Wall [*Prof. Fred. Hobday, F.R.C.V.S.*].—Poodle bitch, nine years, had constant attacks of sickness. Generally under the effect of bismuth, her appetite is very capricious. She had pyorrhea, her teeth attended to and gums dressed with astringent lotion. Diarrhœa then set in and finally she grew in such a miserable state that she was destroyed. At post mortem there was found a small, round-celled sarcoma in the shape of a tumor, the size of a large filbert nut, imbedded in the wall of the large intestine.—(*Ibid.*)

FRENCH REVIEW.

By Prof. A. Liautard, M.D., V.M.

Suppurative Tuberculosis of a Lymph Gland in Cattle [*Mr. Deme, Sanitary Inspector*].—While this condition is fre-

quent in superficial glands, it has also been observed in visceral groups. In this case the suppurative process took place in intermuscular glands.

A four-year-old steer had an enlargement on the right gluteal region with fluctuation on the superficial part of the thigh. A stimulating friction was made and after a few days a puncture gave escape to four litres of pus. Notwithstanding antiseptic washings, the suppuration kept up. Three months after, another tumor developed on the right shoulder. The animal was slaughtered.

Post Mortem—Round the liver there are suppurating lymph glands. Mesenteric, bronchic and retro-pharyngeal glands are normal. The right popliteal was as big as a man's head, filled with tubercles and caseo-purulent fluid. The subcutaneous connective tissue and close intermuscular spaces were infiltrated with pus. The right pre-scapular gland was enormous, surrounded with a thick, fibrous envelope and contained tuberculous suppurating deposits. The carcass was destroyed.—(*Rev. Gen. de Med. Vet.*)

Old Fistula Healed with Paste of Bismuth [*Mr. Balnay, Army Veterinarian*].—A mare receives a kick on the internal face of the left thigh. A fistula follows which remains rebellious to antiseptic injections. She is, however, kept at work. Some ten months later she is laid up again on account of the fistula. New free incision and counter opening followed by injections of tincture of iodine. Another failure. The discharge from the fistula is very free, while-yellowish, and covers the whole leg down to the foot. The animal is cast, the opening of the tract is freely incised, and a probe introduced in the fistula runs forward and upward towards the triceps cruralis muscle. Complete curettage is impossible, but is carried as far as possible, and antiseptic injections again resorted to, but after one month the case is as bad as ever. At last an injection is made of subnitrate of bismuth in vaseline, melted wax and paraffine. The opening is kept closed with a pad until hardening of the mixture. The secretion began to dry after nine days, finally stopped and had not returned six months after.—(*Bullet. Soc. Cent.*)

Section of the Tendons of Hind Leg in a Steer—Treatment—Recovery [*Mr. P. Herbet*].—A steer harnessed to an American cutting machine got accidentally the tendons of the left hind leg completely cut. The animal cannot move except with difficulty; the foot is very free in its movements, as if the

first phalanx was fractured. The animal rested on the posterior part of the fetlock. The animal was removed to a stable close by. The treatment consisted in a first antiseptic dressing and repeated irrigations of cold solution of lysol. The animal laid down, got up and stood now and then for fifteen to twenty minutes. Later iodoform dressing only was applied. Cicatrization was complete after a month. The cicatricial tissue gradually became hard, retracted, and son the animal was able to resume work.—(*Journ. de Zootech.*)

SPRINGHALT [*H. Tingand*].—Fifteen-year-old gelding has springhalt of both legs. The flexion is so strong that he strikes his abdomen at each step that he takes. But after a few steps the springy flexion was not so severe. Trotting was altogether impossible. Tenotomy of the lateral extensor of the phalanges of the right leg was performed. Improvement was noticed the next day and the trouble removed entirely after a week, when the left leg was then operated, with the same result. Recovery lasted.—(*Ibid.*)

ENDEMIC SPRINGHALT [*Prof. Cadeac*].—In a breeding establishment, three animals of various ages were found affected with springhalt, as an endemy by imitation.

An eight-year-old half-bred mare in foal had springhalt of the left leg and then of the right. She has much difficulty in moving and strikes her abdomen at each step she takes.

A three-year-old filly is soon affected with similar trouble of both legs. She is threatened with falling at every step she makes.

A brood mare, also in the same field with the other two, also takes the same trouble in one leg.

A fourth animal, a colt, in the same field did not become lame.

The operation performed on the filly gave temporary relief. For the other two, the trouble disappeared as soon as they had foaled.—(*Journ. de Zoot.*)

BELGIAN REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

OSTEO-SARCOMA OF THE FACE IN A COLT [*Prof. Hendrickx*].—Rising now three years' old, the subject had presented nothing abnormal up to the time of being weaned, when he presented a swelling on the face at the place where the strap of the halter

crosses it. This was overlooked and neglected by the owner until it had assumed peculiar proportions and growth. On the right lateral side of the nasal region there is a tumor on the median line, measuring at its base 34 centim. round, on the top 41, and between about its middle, 18. Rather regularly rounded, the growth is hard, immovable and painless. The intermaxillary lymph glands are normal. Treatment: Incision of the skin and dissection three centimeters from the base, exposure of the growth, which is amputated with the chain-saw close to the nasal bone. The surface of the amputation showed a spongy tissue in which the elements of sarcoma were detected with the microscope. The cicatrization was uneventful and perfect. The growth had not returned four months after.—(*Annales de Med. Vet.*).

POLYPUS OF THE ETHMOIDAL TURBINATED AND OSTEO-SARCOMA OF MAXILLARY BONE IN A HORSE [*By the same*].—The animal was three years old. Condition: The head is asymmetrical, the left side is much larger than the right. The left nostril is filled with rosy neoformation, as big as a big apple, covered with the nasal mucous membrance. With the finger introduced in the nasal cavity, it is observed that the growth is pedunculated and inserted at the apex of the ethmoidal turbinated bone, of which it forms a large prolongation. Besides this growth, the animal showed a marked deformation involving the nasal, superior maxillary, zygomatic, lachrymal and frontal bones. Examination of the buccal cavity shows that the maxillary bone is enlarged, the palatine arch is also. Three of the molar teeth are loose. The food passes from the mouth into the alveolar cavities. The lymph glands of the intermaxillary space are swollen. A diagnosis of osteo-sarcoma of the maxillary was made. After removal of the growth of the nostril by amputation of its peduncle, trephining was made over the bones of the face to enter the sinuses when the extent of the disease was found such that for economy's sake it was decided to destroy the horse (*Ibid.*).

EQUINE TUBERCULOSIS [*Prof. Lienaux*].—The record of four cases, three of which had been diagnosed during life of the subjects.

First Case—Chronic Pleurisy: Adult gelding, suspected of tuberculosis, gave a negative test of tuberculin. The horse has bilateral thoracic dulness on percussion—no pneumonia. Early and repeated punctures are made. The effusion always returns.

After two weeks of treatment horse is destroyed. Lesions of pleuro-pulmonary tuberculosis are found. Also some small specific tumors in the spleen and the large colon.

Second Case—Primitive Abdominal Tuberculosis: Half-bred horse in which the classical march of the disease was followed for three or four months. He had polyuria, polydipsia, irregular appetite, slow progressive loss of flesh, temperature varying round 39.5° C., prescapulars, lower cervicals, percrural lymphatic glands enlarged. Rectal examination revealed enlarged mesocolon lymph glands. After death, abdominal and pulmonary glandular lesions were found.

Third Case—Retropharyngeal and Cervical Adenitis: Two-year-old stallion has the throat swollen, also the parotids. Under the superficial lower muscles of the neck there is one ovoid tumor, very hard. Through the swelling of the throat several hard irregular tumors are felt. Under the partoids an indurated mass is detected. These tumors are all situated on the course of lymphatics. Tuberculosis is suspected, although no other signs of the disease are present. Tuberculin test gives a positive reaction of 2°. Animal is destroyed. The pharyngeal, superior cervicals and one inferior are the seat of characteristic lesions.

Fourth Case—Chronic Enteritis and Diarrhoea: Heavy draught gelding, aged three years, has diarrhoea for six weeks, which remains rebellious to all treatment. The temperature is 39.5°. Feces liquid. Macro- and microscopic examinations of foecal discharge reveals the presence of tuberculous bacilli. Tuberculin test is positive. The animal is destroyed. The intestines, large and small, and their lymph glands showed characteristic lesions, viz., of paratuberculous hypertrophying enteritis for the first, and caseous degeneration for the second.—(*Annales de Med. Vet.*).

FOREIGN BODY IN THE CHEST [*Mr. Iserentans*].—During heavy draught work in a wood, this horse suddenly reared violently without any apparent cause and shortly after walks very lame on the near foreleg. He is walked home. Some hours after he is very depressed, and moves with his leg carried as one piece and in great abduction. In the right costal region, back of the shoulder, there is a swelling as big as a man's fist, and near the maxilla a penetrating wound, in which a hard and rough body is felt. An incision was made through the skin, the panniculus and great dorsal muscles, when the superior extremity

of the foreign body was exposed, secured with a piece of cord and pulled out. It was a big piece of wood, 60 centimeters long, 4½ round, more or less cylindrical and covered with sharp asperities. After-care consisted in first repeated injections with sublimated solutions, a rubber drain tube and afterwards irrigations of phenicated or creolined water. A large oedematous swelling followed after the first days, which gradually subsided. Cicatrization was completed after two months.—(*Echo Veter.*).

GERMAN REVIEW.

By JOHN P. O'LEARY, V.M.D.

PASTERIRELLOSIS EQUINA [*Dr. Rohr*].—As will be understood by the name, this is an infectious disease of the horse, presenting varied symptoms, partly as an influenza, partly as an infectious pneumonia and as a typhoid fever. Lignieres examined the blood and exudate of patients in all stages of the disease, and attributes as the cause a coccobacillus "Pasteurella." However, either micro-organisms, especially streptoccocci, have an etiological significance. The disease was observed very frequently among French cavalry horses. From the year 1900 to 1904, 3,428 horses were attacked by the disease, out of a total of 100,000 horses, with about 8.8 per cent. mortality. From 1905 to 1909 the number of animals affected was 3,058, of which number 7.4 per cent. proved fatal. The author confined his observations to the outbreak which occurred during the months of October, November and December, 1910. In all cases the disease showed a remarkable constancy, with a temperature varying from a moderately high degree to a hyperthermia. The pulse was somewhat accelerated and the arteries tense. Occasional lachrymation, the eyelids were edematous and swollen, and the mucous membranes of the lids were stained from a slight yellow to a saffron color. There was also observed swelling of the extremities and sometimes edema of the sheath. The appetite in general was slightly affected. The fever subsided after the lapse of two to three days; likewise the edema of the limbs. Recovery resulted in from five to seven days; there remained, however, for a few days, a stiffness in the gait. Complications arose, such as laryngeal and bronchial catarrhs, and sometimes pulmonary affections, where strangles had prevailed in stables at a previous date. The infectious character of the disease was

beyond question. As Lignieres had demonstrated the coccobacillus " Pasteurella " is the cause of the disease. This bacillus is a toxine former and creates a predisposition for the growth of other micro-organisms, particularly for micrococci. The organism is found in the manure and dirty straw in which it retains its vitality and multiplies. The disease appears more frequently in the harvest, during the rainy season. The affected animal is largely the centre of infection, in its body it harbors the germ, where it multiplies and is given off through the secretions and excretions. The manure and all other objects and attendants that are in contact with the infected animal spread the disease. As prophylactic measures, the stables should be thoroughly ventilated. Plenty of light and air are prerequisites, both having a decided bactericidal action. In outbreaks of the disease, the affected animals should be immediately isolated, the doors and windows of the stable should be thrown open to admit an abundant supply of light and air. In the treatment of the disease, caffeine, camphor and salicylic acid are recommended.—(*Berliner Tierarzthche Wochenschrift, No.* 42. 1912).

A Case of Cutaneous Bovine Tuberculosis in Man [*G. Cosco, B. Rosa and C. de Benedictis*].—One of the authors (de Benedictis), veterinary inspector in the public slaughter house at Rome, infected a slight wound in his hand with tuberculous matter while engaged in the post-mortem examination of cattle. After a few days there had formed an inflammatory foci, which later developed into a nodule. The swelling shaded in color to a dark violet and was painful. It attained the size of a lentil and gradually became soft, doughy and cheesy. The skin was perforated and the cheesy mass bacteriologically examined. A tubercle bacillus was isolated which belonged to the bovine type. After proper treatment, complete recovery followed (*Centralblatt fur Bact., U. S. W.,* 1912, 66 *Bd., S.* 161).

Fasciola Hepatica in Fasting Calves [*Dr. K. Buchli and Dr. D. A. de Jong*].—As a result of a post-mortem examination held upon five fasting calves, varying in age from one to three days, which, upon ante-mortem examination presented no symptoms of disease, revealed the presence of distomum, while incisions were made into the hepatic glands. As pressure was being exerted upon the large superficial bile ducts in the porta, hepatis, a specimen of the fasciola hepatica came into view. The superficial hepatic ducts appeared somewhat inflamed and their walls

slightly thickened. In the five livers only a small number of distomum were harbored. In the first liver only three were found, probably for the reason that a careful examination had not been made. The length of the parasites varied from 1 to 1½ centimeters. Icteric symptoms and ascites were lacking in these cases. Whether their mothers had similarly suffered could not be ascertained.—(*Tydschrift voor Veeartsenijkunde,* 38 *ste Deel Aflevering* 17, *Sept.* 1, 1912, *Seite* 663-667).

CONCERNING THE APPLICATION OF THE ROENTGEN PROCEDURE IN THE DIAGNOSIS OF PREGNANCY [*Dr. L. Edly, in Malmo*].—For diagnostic purposes, perfect Roentgen pictures of the foetus can be obtained in the beginning of the third month of pregnancy; also abnormal positions and malformations can be diagnosed through the Roentgen procedure. Further, the diagnosis of multiple foetuses can be established without difficulty in the first half of gravidity. Hitherto injury to the foetus through Roentgen examinations has not been observed.—(*Münchener Mediz Wochenschrift,* 58 *Jahrg.,* 1911, *No.* 567).

THE SIGNIFICANCE OF THE BLOOD CLOT WITH REGARD TO THE ORIGIN OF THE THROMBUS [*Dr. K. Küster, in Breslau*].—In many instances it is thought that the coagulability of the blood depends particularly upon its richness in ferment or fibrinogen or both together, and that this is of much importance in the formation of thrombi. According to the methods of Arthus and of Wohlgemuth, the ferment value of the blood serum and the fibrinogen worth of the blood plasma have been relatively determined. These methods depend upon basic experiments; for instance, when the blood streaming from a vein was allowed to flow into a solution of magnesium it remained fluid. The plasma obtained by centrifugalization contains fibrinogen, but no fibrin ferment. When fresh serum is added to such plasma coagulation occurs. As a result of the clinical importance of the above method and upon the ground of other independent experiments, Küster concludes that the participation of the above-mentioned fibrin generators in the formation of thrombi is doubtful, and that the connection between blood-clotting and the thrombus cannot be established at the present time.—(*Münchener Mediz. Wochenschrift,* 1, 11, *Seite* 2442).

SCLEROSTOMIASIS IN FOALS.—Concerning sclerostomiasis in foals, numerous observations have been made by official veteri-

narians in the government districts of Königsberg and Gumbinnen, and which appeared in the annual report for the year 1909. Apart from the aneurisms of the mesenteric arteries many interesting pathological processes were observed in the post-mortems. For example, infarcts in the cortical substance of the kidneys, with hemorrhages in the venal capsule and in the neighboring subperitoneal connective tissues, embolic infarcts in the spleen, with rupture of its capsule and hemorrhages in the abdominal cavity. Rupture of the walls of the aneurisms of the posterior mesenteric arteries and hemorrhages in the abdominal cavity. Thrombosis of both venal arteries. In the case of a cachectic foal, on post-mortem examination the colon and cæcum were beset with numerous nut-like nodules containing a thick greenish pus and a specimen of the strongylus armatus; similar nodules were observed in the lungs. The kidneys were chronically inflamed and partially cicatrized as a result of the embolic nodules. The anterior mesenteric arteries were filled with solid thrombotic masses containing numerous worms.—(*Veröffentlichungen aus den Jahres-Veterinär-Berichten der beamteten Tierärzte Preussens für das Jahr* 1909; 11 *Teil, S* 30, *Berlin*, 1912).

Dr. D. E. SALMON has left Washington, D. C., and gone up to Butte, Mont. After a summer in that high altitude and excellent climate his friends will meet him at the A. V. M. A. meeting in New York bronzed in complexion and in hale condition.

THE HUDSON COUNTY (N. J.) PRACTITIONERS' CLUB held a meeting and banquet on January 30 at Union Hill in that county. This is a social organization whose membership is made up of the veterinary practitioners of Hudson County, which includes the large municipalities of Jersey City and Hoboken. On January 21, preceding the above meeting, the members took their wives and lady friends to New York in a theatre party and had a very enjoyable time. The veterinarians of that county will prolong their lives by the relaxation that such social functions afford.

REVIEW "JOHNNY ON THE SPOT" AND EVERY VETERINARIAN SHOULD TAKE IT.—An Iowa veterinarian writes in renewing his subscription: "I do not want to miss a number, and am always anxious for the next one, as there is always something in it very interesting to me. I think this paper is always 'Johnny on the spot'; every veterinarian ought to take it."

CORRESPONDENCE.

COLLINSVILLE, ILL., February 26, 1913.

Editors AMERICAN VETERINARY REVIEW:

DEAR SIRS—I have been a subscriber to the REVIEW for 12 years; every volume bound, and through its columns I wish to express my gratitude by sincerely thanking Prof. Law, Dr. Dalrymple and the REVIEW for the interest manifested in my perplexity.

During three years' abattoir inspection in B. A. I., I saw Texas fever cases, that I am positive we, in some instances, had something else.

Yours very sincerely,

DR. L. B. MICHAEL.

P. S.—Am enclosing letter from Dr. Dalrymple.

BATON ROUGE, LA., January 20, 1913.

Dr. L. B. MICHAEL,
Collinsville, Ill.:

Dear Doctor—Your esteemed favor of the 14th was duly received. I have been talking over the subject matter of your letter with our entomologist, and we are both rather inclined to think that you may have been dealing with some fly, or condition, other than the Buffalo gnat, as the gnats are worst in the early spring, and are found in the neighborhood of running water—not stagnant water. In fact, they breed in running water.

The localities in Louisiana in which they are prevalent are some distance from Baton Rouge, and I have not had an opportunity of treating cases. The gnats may attack our cattle, but the general complaint is with reference to horses and mules. Some representatives of the Federal Bureau of Entomology have been working on these gnats for some time, and are at present, I believe. No doubt they will have something to publish on

them before long, more than has already been done. My authority for the statement about the gnats emitting a poison was Prof. Osborn, I believe, who had been with the Bureau mentioned for some time. There seems to be no doubt about their causing a great deal of irritation, and local poisoning, but I have not had the opportunity of making a post-mortem examination of any cases.

I thank you for your kindly expressions regarding my *Chicago paper. I hope it may be of as much interest to others as it seems to have been to yourself. With best regards,

Very sincerely yours,

W. H. DALRYMPLE.

* "Some of the More Important Insects Affecting Our Farm Animals," published in January and February, 1913, numbers AMERICAN VETERINARY REVIEW.

OBITUARY.

ALFRED M. SCHALBERG, D.V.M.

Dr. Alfred M. Schalberg, Chicago, Ill., died on February 8 after an operation for appendicitis. Dr. Schalberg was a graduate of the New York State Veterinary College, class of 1909, and was employed in the government service as meat inspector, stationed at Chicago, at the time of his death. The members of his class learn with regret the sad tidings of the death of their young friend, rendered especially sad from the fact that he leaves a widow and infant son.

IN MEMORIAM.—"JOHN RUTGER PLANTEN" is the inscription on a folding photo case bordered with a heavy mourning line and containing within it a lifelike picture of the above-named gentleman, who died on December 8, last. Mr. Planten was born in Amsterdam, Netherlands, in 1835, and became a member of the firm of Planten and Son, manufacturers of gelatine capsules, in 1857, the firm having been established by his father, in 1836, in New York. Mr. Planten was one of the good old New Yorkers, and his face was good to look upon.

ARMY VETERINARY DEPARTMENT.

"LOST OUT."

"Lost out. B. refused to report Bill Hoskins." These terse words conveyed to us the failure of the army veterinary bill, H. R. 16843, in the closing days of the 62d Congress.

It would be useless to lament over the result beyond ordinary regret. It would be a waste of time to search for mistakes made by some one of us in order to gratify a desire for criticism, and to be able to say: I told you so. No great mistakes, if any, have been made by our representatives in charge of the bill. They were of the best among us, earnest, faithful and experienced men, imbued with a just spirit and with no more than a reasonable pride in our profession. They are entitled to our gratitude even now in the face of defeat.

What we ought to think about now is how to strengthen anew their arms, how to further encourage their good efforts, and how best to stand by them without faltering in the struggle to be renewed for right and justice of our cause.

We are right, because this army veterinary bill, if enacted into law, would have been for good government, of far-reaching economic value to the costly mounted service of the army, and it would have been of humane interest to all those who have a heart for the burdened army horse.

The bill contained no wild scheme, concocted by an over-ambitious clique, or by a body of men who unduly estimate the value of the services they render to the people of the country. On the contrary, it was a truly moderate measure, merely recommending to improve a branch of the federal service that has been notoriously neglected and kept shamefully backwards. This we can prove. Although we are apt to proudly proclaim to the world that we lead in civilization, here is our army veterinary service outstripped in organization and efficiency by second and third-rate nations of Europe. If there was anything ambigious in this bill, anything contrary to strict honesty and clean purpose, few of us in the army would have approved of it, and none of our colleagues in civil life would have supported it, because they are disinterested and neutral. Moreover, the bill, if wrong or

unnecessary, would not have passed the House of Representatives unanimously, for it was there thoroughly searched, carefully altered to suit the wishes of the War Department and to satisfy the objections of one or two legislators.

In spite of all this we are told that one man, a Senator of the United States of America, held up our bill to defeat. It seems hard to believe that the rules and methods of our highest legislative body permit such single-handed proceeding. It seems equally difficult to understand that the dignified, exalted position of a Senator could lend itself to such small tactics, from whatever reason of his own or by whatever influence of other parties. It could not be courage that actuated this Senator to pocket our bill, for true courage is born of a feeling that a wrong must be righted, which is exactly what our little bill attempted to accomplish. In its last aspect it appears as contempt, or as effrontery, to stand off a whole profession, united on this issue, honorable in its work, honest as to purpose, modest rather than overbearing, willing to serve well, and anxious to still further extend its usefulness. To judge mildly, this Senator is in error. Although he has sinned against us, may none of us threaten him with vengeance, but let us prove to him our mettle by convincing him of his error with a broad-minded spirit of forgiveness.

It becomes now our duty to do over again the battle just lost. Defeat is a severe teacher, and we have learned some valuable lessons in the fight just ended. They may have been costly, but on the whole neither labor nor money, only time, has been lost in working with the 62d Congress. It was a valuable preliminary skirmish to determine the forces of possible opponents, and we were agreeably surprised to find many friends and unexpected supporters.

As the next Congress, in its working organization, will be of one political faith, at least one great factor of defeat, the political dissension between the House and the Senate, will be removed. We ought to reap the fruit of this change in politics.

Let us think, therefore, that the prospects of success are good with the 63d Congress. Such is wholesome optimism, that will strengthen our fibres and keep up our heart. When this new Congress opens its doors on April 7, 1913, it will see our representatives among the first to enter them and file anew our claim, while we, the others of the line, strewn all over the country, shall back them up with a will, cheer them up, and pray that the next time they may "win out."

O. S.

BIBLIOGRAPHY.

SPECIAL PATHOLOGY AND THERAPEUTICS OF THE DISEASES OF DOMESTIC ANIMALS.

SPECIAL PATHOLOGY AND THERAPEUTICS OF THE DISEASES OF DOMESTIC ANIMALS, by Dr. Franz Hutyra, Professor of Infectious Diseases, and Dr. Josef Marek, Professor of Special Pathology and Therapy; both of the Royal Veterinary College at Budapest. Authorized American Edition from the Third Revised and Enlarged German Edition. Edited by John R. Mohler, V.M.D., Chief of Pathological Division, U. S. Bureau of Animal Industry, and Adolph Eichhorn, D.V.S., Senior Bacteriologist, Pathological Division, U. S. Bureau of Animal Industry, Washington, D. C. Volume II., Diseases of the Respiratory Organs, Diseases of the Digestive Organs, Diseases of the Nervous System, Diseases of the Organs of Locomotion, Diseases of the Skin. Over 1,000 pages, with 163 illustrations and 5 plates. Chicago, 1913, Alexander Eger.

In our November number we had the pleasure of reviewing Volume I. of this excellent work; and now the second volume, translated by our esteemed friend, Maximilian Herzog, M.D., late Pathologist in the Bureau of Science, Manila, P. I., Professor of Pathology and Bacteriology in the Chicago Veterinary College, Pathologist to the German and Alexian Brothers' Hospital of Chicago, etc., etc.; A. Leslie Sheather, M.R.C.V.S., B.Sc., Pathological Department, The Royal Veterinary College, Camden Town, London, England, and G. Mayall, M.R.C.V.S., Bolton, England, and edited by John R. Mohler, V.M.D., Chief of Pathological Division, U. S. Bureau of Animal Industry, and Adolph Eichhorn, D.V.S., Senior Bacteriologist of the same division, Washington, D. C., has recently appeared on our desk, magnificent in external appearances as its elder brother.

Volume I. ended with an excellent chapter on the diseases of the blood vessels, and Volume II. begins with the *Diseases of the Respiratory Organs;* and Section I. (the word section being used in place of chapter) gives a very exhaustive treatise on the *Diseases of the Nasal Cavities and of the Accessory Cavities of the Nose;* in which hemorrhage from the nose, nasal catarrh, including the contagious form in birds, swine and rabbits, croupous rhinitis, follicular inflammation of the nasal mucosa, new growths in the nasal cavities, animal parasites in

the nasal and accessory cavities, catarrh of the maxillary sinus, myxoid degeneration of the turbinated bones and of the facial bones in the horse, inflammation of the cella infraorbitalis in fowls, catarrh of the frontal sinus, catarrh of the guttural pouch, and bloating of the guttural pouch. All these subjects, of such vital interest and importance to the general practitioner, are clearly described in such an interesting and comprehensive manner, that the reader gains enlightenment while experiencing the minimum of fatigue in their study. Section II. treats of the *Diseases of the Larynx* just as completely as the diseases of the nasal cavities are treated in the previous section; followed by the *Diseases of the Bronchii* in Section III., and *Diseases of the Lungs* in Section IV., in which a hundred pages are devoted to the many diseases and complications of diseases of these vital organs, the subject being generously illustrated. *The Diseases of the Digestive Organs* are then taken up, divided into eight sections, as follows, and in the order named: *Diseases of the Buccal Cavity; Diseases of the Salivary Glands; Diseases of the Oesophagus; Diseases of the Stomach and Intestines; Diseases of the Liver; Diseases of the Pancreas; Diseases of the Peritoneum;* covering more than 400 pages, and including 49 illustrations; picturing such conditions as pseudo-aphthous inflammation in cattle, introduction of the œsophageal sound in those animals, ectasia of the œsophagus in a horse, X-ray of metal buttons in the crop of a hen, loop of intestine strangulated by a lipoma, and other forms of intestinal strangulation; torsion of the colon, volvulous of the small colon, invagination in a horse and in a dog, abdominal parasites; diagrams showing areas of hepatic dullness in the horse, the cow and the dog; cuts from photographs showing distention of the abdomen due to ascites in the horse and in the dog; the variety of the illustrations suggesting the wide range of maladies treated of, from occlusion of the crop in the fowl to bloating of the cow and colic in the horse; in which, by the way, the author prefers the use of the term "colicky affections" to "colic," when used in a general sense; because, as he explains, colicky pains being only a part of a group of symptoms of various affections, he does not think we are justified from a pathological standpoint to consider "colic" as a definite pathological condition. Parasitology is well represented in the consideration of the diseases of the digestive organs. *Diseases of the Nervous System* follow, divided into four sections, as follows: *Diseases of the Brain; Diseases of the Spinal Cord; Diseases of the Peripheral Nerves; Func-*

tional Nerve Diseases, with 94 subdivisions and 38 illustrations, including both clinical pictures and pathological specimens. A consideration of the *Diseases of the Skin,* covering 170 pages of text, with 50 extremely interesting illustrations, including two colored plates, completes the subjects embraced in this most excellent work, to which we know we have not done justice in this superficial review, and feel equally sure that we could not do it justice if we spent months in reviewing it, as it has taken years of tedious labor and study on the part of the German authors to produce; but we have endeavored, in our humble way, to point out *some* of the things it contains. And when we stop to consider that it is the product of two of the ablest pathologists of Continental Europe, translated into the English by one of America's and two of Great Britain's ablest pathologists, and edited by the chief pathologist and senior bacteriologist of the United States government, assisted by an editor on a medical journal, there is not much left to the imagination.

So that *Special Pathology and Therapeutics of the Diseases of Domestic Animals,* by this refining process through which it has passed before reaching English-speaking veterinarians, is unquestionably reduced to the very essence of science and exactness, and is an essential to every veterinarian. The publisher deserves great credit for the manner in which he has executed his work and placed this second volume of the work of Hutyra and Marek, clearly printed, splendidly illustrated and handsomely bound, within the reach of the veterinarians of America.

RESIDENCE OF DR. W. O. KEMP.—Some time ago we were pleased to receive an 8 x 10 photograph showing the residence of Dr. W. O. Kemp, at Key West, Fla., the doctor reclining in an easy rocker on the veranda and Mrs. Kemp standing beside him, making a beautiful home picture that we should have liked to reproduce but for lack of space. The picture shows a splendid up-to-date residence with veranda running across the entire front and half-way around sides on both first and second floors; the house is set in a large plot of ground, surrounded by garden, with stable on one side of the grounds, and surely does credit to the doctor's industry. The stars and stripes float from a staff attached to the second balcony, and the whole picture actuates a desire in one to grasp Doctor Kemp by the hand and congratulate him, and we as well as all his brother veterinarians *do,* through this medium.

SOCIETY MEETINGS.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY, FEBRUARY MEETING.

The regular monthly meeting of this association was called to order by the president at 8.45 p. m.

The minutes of the January meeting were read and approved.

The prosecuting committee reported that they had obtained evidence that H. F. Nimphius was practicing unlawfully, and had had him summoned to appear before the chief magistrate on Friday, February 7, 1913.

Mr. Nimphius was present and spoke in his own behalf, stating that owing to some unfortunate error or misunderstanding, that instead of being required to have 48 Regents' pass counts, which he was given to understand was the requisite number, sixty pass counts were required before he would be eligible to take the state board examinations and receive a diploma. Drs. Gill and Ellis both stated that although Mr. Nimphius was undoubtedly guilty of practicing illegally, it was unfortunate that the committee had taken the initiative in this particular case.

Mr. Nimphius also stated that he now lacked only one or two counts of the required sixty, and expected to make up these at the next Regents' examination.

It was regularly moved and seconded that Drs. Gill and Ellis be appointed as a committee to ask the magistrate that clemency be extended in this case. Carried.

The "smoker" committee reported that arrangements had been made to hold the annual "smoker and reunion" on Wednesday evening, February 19, 1913, at Reisenweber's.

A letter from Dr. J. A. McLaughlin declining to further discuss his paper was read by the secretary.

Dr. Chase stated that undoubtedly Dr. McLaughlin had given a great deal of time and study to his subject, and moved that an apology be tendered Dr. J. A. McLaughlin by this association for the manner in which his paper had been criticised at the January meeting. Seconded and unanimously carried.

Dr. C. G. Rohrer then read an interesting and instructive

paper on "Follicular Mange," which was discussed by several members and visitors.

Dr. Crawford stated that he had had good results from the use of the Staphalo Bacterines.

Dr. Blair said that he also had excellent results with Parke, Davis & Co.'s vaccine and cited four cases that he has under treatment at the present time and all doing well. He also agreed with Dr. Rohrer that the only accurate means of diagnosing this trouble is by the use of the microscope.

Dr. Ackerman asked if the vaccines were beneficial in cases of chronic eczema, and Dr. Rohrer stated that in his experience they were not.

Dr. Ellis stated that he had good results by applying oleaginous remedies freely, and allowing them to remain without washing off for a period of about two weeks. Stated that he generally used the picric acid, oil of tar and vaseline mixture with good results. The stain due to the picric acid, it is stated, can be readily removed by the use of a saturated solution of hyposulphite of soda.

Dr. C. J. Marshall, of Philadelphia, gave the history of a cocker spaniel which had been treated for six or eight months without results and finally made an apparently spontaneous recovery.

Dr. Cochran also cited some interesting cases, and some that he had seen at Ithaca. Dr. Rohrer then closed the discussion and on motion he was tendered a vote of thanks.

Dr. Ellis then gave a clear and concise report of the Conference on Glanders held in New York City by the Commissioner of Agriculture on January 17, 1913.

Dr. Ackerman read a letter from Dr. Cotton, of Minnesota, who recommended the destruction of all clinical cases of glanders and all reactors.

Dr. Marshall also spoke on this subject and gave a brief outline of the method of handling glanders in Pennsylvania.

Dr. T. E. Smith, of Jersey City, N. J., also made a few remarks and stated that in New Jersey they were endeavoring to establish a commission, with a veterinarian as chief, with the object of better controlling this disease.

Dr. J. G. Wills, Chief Veterinarian of the Department of Agriculture, stated that authority to sign condemnation papers had been arranged in New York City, and also an appraiser

appointed to appraise condemned animals, relieving the veterinarians of the department of that duty. Also stated that a conference on glanders for horse-owners would be held by Commissioner Huson, some time in the near future, to give them an opportunity to voice their views on this important subject.

A general discussion of this subject by several of the members and visitors then followed.

Drs. Cochran and McKinney then gave an interesting report of the Veterinary Conference at Ithaca.

Dr. E. B. Ackerman exhibited an interesting specimen of a tumor on a dog's foot.

Drs. Thomas E. Corwin, Max Danziger and George J. Goubeaud, whose applications for membership had been approved by the Board of Censors, were unanimously elected as members of this association.

Several papers were promised for the March meeting.

No further business appearing, the meeting adjourned.

R. S. MacKellar, Secretary.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY, MARCH MEETING.

The regular monthly meeting of this association was called to order by the vice-president, Dr. R. H. Kingston at 8.45 p. m. Dr. McKinney, being ill was unable to attend.

Through the good offices of Dr. R. W. Ellis, the members and visitors of this association, were treated to a literary feast by Prof. E. A. A. Grange, Principal of the Ontario Veterinary College, and Dr. Thos. B. Rogers of Woodbury, N. J., both personal friends of the doctor's who came in response to his request to address the meeting.

The subject of Prof. Grange's address, was "The Latest Call to Veterinary Science," and that of Dr. Rogers' paper, "Certain Phases of Operative Surgery," and both subjects were presented in the interesting and able manner, so characteristic of those gentlemen; and the members of the association are deeply obligated to them for the entertainment and enlightenment which their addresses furnished, and are indebted to Dr. Ellis for procuring them for the occasion.

Prof. Grange prefaced his address with some very pleasing preliminary remarks. He then traced the course of veterinary science from as far back as there is any record of it down to the present time. "The latest Call to Veterinary Science," which Prof. Grange terms the greatest science on this continent, is the demands being made on the veterinarian of to-day for advice and information, not only in regard to the old line of practice, but as to diseases of fowl, botanical research and numerous other matters of vital importance to the growth and welfare of the country.

The veterinary profession will be looked to to solve these different problems, and it behooves us to meet this demand.

Prof. Grange closed his remarks by extending an invitation to all the members to attend the celebration of the fiftieth anniversary of the Ontario Veterinary College, on the 10th of April, in Convocation Hall, Toronto, Canada.

In opening the discussion of Prof. Grange's address, Dr. Berns said that he had enjoyed the address and thought it very encouraging to the veterinary profession.

Dr. Coates also spoke of the advance in veterinary science.

Dr. Gill concurred with the remarks of Prof. Grange, and said that we are now entering an era of sanitary policing. A unanimous vote of thanks was tendered Dr. Grange.

Dr. Rogers was then introduced, and before reading his papers made some witty and pleasing remarks. The doctor made an earnest plea that veterinarians in their surgical work, endeavor to follow as nearly as possible the technique of the up-to-date human surgeon, especially as to aseptic measures and the use of anæsthetics.

In discussing this paper Prof. Grange spoke in favor of aseptic surgery, also Dr. Cochran. Dr. Coates related some of the wonderful results obtained in human surgery by the use of thorough aseptic measures. Dr. Gill said that the veterinarian, owing to surroundings, has great difficulty in reaching the ideal in operative surgery.

Dr. Ellis expressed his appreciations of this subject and incidentally advocated the use of general anæsthesia in the smaller animals, such as the dog, in the minor surgical procedures of routine practice, as in cases of suturing wounds, setting fractures, etc.

Dr. Blair said that Dr. Rogers had set a high ideal for veterinarians to strive for in their surgery.

Dr. Rogers in closing said that although this idea might not be reached it was a "Good star to hitch our wagon to." A hearty vote of thanks was tendered Dr. Rogers.

The "Smoker Committee" reported a balance of $2.90, and on motion regularly made, seconded and carried, this report was accepted and the committee discharged with thanks.

The Prosecuting Committee then rendered a report of the Nimphius case, stating that Mr. Nimphius had been discharged on his promise that he would not practice again until fully qualified, and a written release of this association from any legal action had been obtained. This report was on motion received.

An animated discussion of the prosecution of illegal practitioners then took place.

Dr. Mangan advocated the upholding of the Prosecuting Committee, and said no exceptions should be made in cases of illegal practice.

Dr. Gill said that in his opinion a man practising illegally should be asked to stop, before legal action is taken.

Dr. Ellis and Dean Coates explained in detail the Nimphius case, showing by Dr. Coates' records that Mr. Nimphius had endeavored to comply with the law, and was at the time of service by the Prosecuting Committee within 1½ counts of the required number to register; that being 60.

Dr. Berns moved that the action of the Prosecuting Committee be endorsed; seconded and carried.

Dr. Mangan moved that the Prosecuting Committee be empowered to take action against all illegal practitioners in Greater New York; seconded and carried.

Dr. Blair moved that the discussion of the Nimphius case be closed; seconded and carried.

Dr. P. K. Nichols then read a set of resolutions relative to sanitary control work in Greater New York, to be presented to the Commissioner of Health for his consideration.

Dr. Berns moved that these resolutions be endorsed by this association; seconded and carried.

Assembly Bill No. 1085—entitled an act to amend the Public Health Law, in relation to filing a certificate for the practice of Veterinary Medicine and Surgery, was read by the secretary.

After some discussion, Dr. Mangan moved that the secretary be instructed to write the chairman of the Committee on

Public Health protesting against the passage of this act; seconded and carried.

No further business appearing the meeting adjourned.

There were over sixty members and visitors present.

ROBT. S. MACKELLAR, Secretary.

NOTES ON THE RECENT MEETING OF THE NORTHWESTERN OHIO VETERINARY MEDICAL ASSOCIATION AT TOLEDO.

At the February meeting of the Northwestern Ohio Veterinary Medical Association, President John V. Newton, of Toledo, gave an address on the subject of bovine tuberculosis, in which he laid great stress upon the absence of ventilation in stables as being an active factor in the development and encouragement of that disease, and stated that proper attention to the important question of stable ventilation will pave the way for a policy of eradication and greatly add to the chances of success. Another point upon which the doctor laid considerable stress, was the education of the dairyman, which he believes it is the duty of the veterinary profession to bring about, by conducting a campaign among the stock-owners, looking toward the betterment of conditions under which animals are kept. "No campaign against bovine tuberculosis ever will succeed," said the doctor, "until the owners recognize the fact that a diseased herd does not pay, and that it is to their *interest* to keep only healthy ones." Seventy-five enthusiastic members were present when President Newton made his opening address. After which Dr. William A. Dickey, president of the Toledo Academy of Medicine, gave an address of welcome, to which Dr. F. F. Sheets, of Van Wert, responded. The opening exercises were followed by a luncheon, after which papers were presented by Drs. G. W. Cliffe, Upper Sandusky; W. G. Clark, Findlay; W. B. Washburn, Tiffin; E. W. Proble, Elmore; Fred. Miller, Fort Recovery; J. H. Blattenberg, Lima; C. W. Fogle, Leipsic; B. C. Eldredge, Canton; C. E. Hershey, Tiffin; S. E. Bretz, Nevada; J. E. Turner, Kenton, and Drs. John Coffen, James F. Barnes and R. C. Longfellow, of Toledo. In the evening the members and visitors went to the Commerce Club for dinner, where they were welcomed in an address from President Mulholland of the club. Among the after-dinner speakers were: Drs. A. S.

Cooley, Cleveland, President of the Ohio State Veterinary Medical Association; Reuben Hilty, of Toledo, and F. E. Anderson, of Findlay. Dr. Anderson's remarks were in the form of a paper, entitled *" Mistakes in Everyday Practice," which was very amusing and very much enjoyed by his fellows. Dr. B. C. Eldredge, of Canton, was elected to succeed Dr. Newton as chief executive.

VETERINARY ASSOCIATION OF MANITOBA.

At the annual meeting of the Veterinary Association of Manitoba held recently in the Industrial Bureau at Winnipeg, the following officers were elected: Council—W. Hilton, C. D. McGilvray, W. A. Shoultz, W. A. Dunbar and E. P. Westell, of Winnipeg; S. A. Coxe, Brandon, and I. B. Irwin, Stonewall. Dr. E. P. Westel was elected president, Dr. W. A. Shoultz, vice-president, and Dr. W. Hilton, secretary-treasurer and registrar. The Board of Examiners consists of C. D. McGilvray, W. A. Dunbar and W. Hilton, and the auditors, C. Little and T. Z. Woods. It was voted that the next semi-annual meeting be held at Winnipeg, and the next annual at Brandon. The following papers were presented, and were fruitful in promoting excellent discussions: "Tuberculosis—Its Control and Eradication," by W. A. Hilliard; "Serum in the Treatment of Tetanus," by S. T. Martin; "Soundness in Horses," by W. A. Shoultz; "Federal Registration for Veterinarians in Canada," by C. D. McGilvray, and "Postmortem Lesions," by R. S. McLoughry. The following men were elected to honorary membership: F. Torrance, Veterinary Director-General of Canada; W. Taylor, Portage la Praire, retiring president; Hon. D. H. McFadden, N.S., M.P.P. A resolution was passed, congratulating Dr. Fred Torrance on his appointment as Dominion Veterinary Director-General. A banquet was held in the evening, at which everyone enjoyed themselves thoroughly.

WILLIAM HILTON, Secretary-Treasurer.

YORK COUNTY VETERINARY MEDICAL SOCIETY.

The above society met at York on March 4, 1913. There were a number of interesting papers presented on "Foreign

* Published on page 84 of this issue of the REVIEW.

Bodies in Cattle," "Parturient Apoplexy," "Pollevil and Fistulous Withers in Horses," "Rabies in Dogs and Cats" and "Lameness in Horses"; all of which were fully discussed by the members present. This being the annual meeting, officers were elected for the ensuing year as follows: President, Dr. F. M. Kain, York; first vice-president, Dr. Fred Hartenstein, New Freedom; second vice-president, Dr. C. A. Kain, York; secretary, Dr. E. S. Baustícker, York; treasurer, Dr. Charles Lenhart, York. Trustees: Drs. E. A. Winter and W. L. Herbert, York, and J. B. Smith, Dallastown. Three applications were received for membership. One new member was elected.

E. S. BAUSTICKER, Secretary.

A BROTHER IN CALIFORNIA WRITES.—"Your notice of expiration of my subscription just to hand. The AMERICAN VETERINARY REVIEW is one of my most welcome visitors. I certainly can't exist without it; consequently I'm enclosing check for renewal."

HAS BOUND VOLUMES FOR TWENTY-ONE YEARS.—The resident state secretary for Wisconsin, A. V. M. A., writes: "I have a complete bound file of the AMERICAN VETERINARY REVIEW from April, 1892, and I consider it one of the most valuable reference works in veterinary medicine."

SEND THE BILL BUT DO NOT STOP REVIEW.—An old subscriber in Maryland writes: "Dear old AMERICAN VETERINARY REVIEW, enclosed find check for my subscription to the REVIEW; as I have told you before, do not scratch me off the list until my death, and then you will be notified. Send the bill but do not stop the REVIEW.

AMOUNT OF SUBSCRIPTION SMALL COMPARED WITH PLEASURE AND BENEFIT RECEIVED.—An old subscriber in Wisconsin writes: "I have the pleasure of enclosing my check for renewal of subscription for the REVIEW; the amount seems very small compared with the pleasure and benefit we receive. Permit me to express my appreciation and best, best wishes for your future success."

NEWS AND ITEMS.

PROF. GRANGE ADDRESSES GOTHAMITES.—At the last meeting of the Veterinary Medical Association of New York City, Prof. E. A. A. Grange, of Toronto, delivered a short address on "The Latest Call to Veterinary Science." He informed its members of many things going on at the present time which should be of interest to all veterinarians and to others who are concerned in any line of the live-stock industry.

His address was opened by a statement that he did not consider it necessary to trace the first call to veterinary science beyond the days of the famous Hippocrates, who flourished 400 years or more before the Christian era. He also spoke very briefly of the centaurs who practiced on both the horse and his rider about this time and from the union of these two arts arose those curious mythical figures—half man, half horse.

He followed the various calls to veterinary science through the Roman conquest, after which, many distinguished men of the Latin race did their best in successfully administering to the ills that horse "flesh is heir to." It is curious to note that during this second period, if it may be so named, both the art and science passed from the hands of the old-time physician into those of the then modern agriculturalists in whose care our science did not suffer.

A number of very distinguished Latin authors arose who celebrated the training of the horse, both in prose and verse, in a most fascinating and instructive manner, nor did they forget to write elaborately upon his injuries and various maladies. Veterinary science advanced steadily until about the fifth century, when it received another call, but unfortunately a backward one, and for some time sank into oblivion. This reign of ignorance continued until Francis the First came to the throne of France, and although he was a "sporty" monarch in some respects, yet "with all his faults we love him still," as under him our science made great progress and there has not been a serious retrograde movement down to our own day. Prof. Grange gave a somewhat lucid though hurried description of the progress of veterinary science through what he called the scholastic period and finally launched into what was in his

opinion "the latest call to veterinary science." After speaking in a complimentary manner concerning the meritorious efforts of leaders in the profession in the United States, he stated that what he thought was the "latest call" came from the Dominion Parliament House at Ottawa. He informed his hearers that a bill appropriating the large sum of ten million dollars had been unanimously passed to be used in the *advancement of agriculture and veterinary science* in that country.

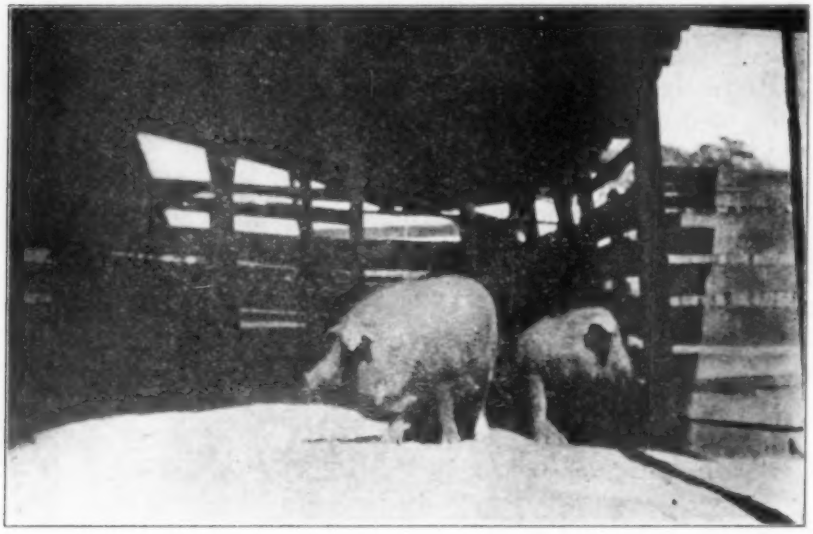
He further stated that he had been instructed to use the share of the appropriation for the college over which he presides, so as to be of real benefit to the veterinary profession. The details as to how the money would be used he did not attempt to state, owing to the whole question having been sprung upon him within a few days, and he is now waiting for a reply to some of his preliminary recommendations. However, he viewed the outlook for veterinary science in the United States and Canada in a very rosy light and looks for a still greater improvement in the near future.

TIDINGS FROM BRAZIL.—In a recent letter from our old friend Dr. J. H. McNeil (late of Ohio State University), from

Some of the natives and Zebu crosses.

Brazil, renewing his subscription to the REVIEW thirty days before it had expired so that he would not miss it in his far-away

home, the doctor expresses great pleasure and satisfaction in his new field; and we believe it will not be a breach of faith if we publish a small portion of his letter that will convey to his North American colleagues, in his own words, his feelings in his new surroundings. We also reproduce the pictures inclosed



Note the wattles—in some sections of Brazil 90% show this.

in his letter, that our readers may share the pleasure derived from them also. Following is an extract from Dr. McNeil's letter:

"I am pleased to state that my work is pleasant and progressing nicely. I have outlined much important work for the coming year. The past year has been a busy one for us all. The imported cattle are doing nicely. We were confronted with some unexpected problems. Referring to what we considered as having been settled in the laboratory, some further work is needed to unravel the tangle."

We are also pleased to be able to promise REVIEW readers something from time to time from Dr. McNeil in connection with the country in which he is conducting his lifework, and the live-stock conditions there.

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary
Alabama Veterinary Med. Ass'n..	August, 1913 ..	Auburn.....	C. A. Cary, Auburn.
Alumni Ass'n, N. Y.-A. V. C.....	April, 1913	141 W. 54th St.	J. F. Carey, East Orange, N.J.
American V. M. Ass'n.....	Sept. 1-2-3-4-5 '13.	NewYork, N.Y	C. J. Marshall, Philadelphia.
Arkansas Veterinary Ass'n.....	.....	.....	J. B. Arthur, Russellville.
Ass'n Médécale Veterinare Française "Laval".....	1st and 3d Thur. of each month	Lec.Room,Laval Un'y,Mon.	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago.....	2d Fri. ea. mo...	Chicago.....	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., So. Omaha ..	3d Mon. ea. mo.	S.Omaha, Neb	E. J. Jackson, So. Omaha.
California State V. M. Ass'n.....	Dec. 11, 1912.....	San Francisco	John F. McKenna, Fresno.
Central Canada V. Ass'n.....	.....	Ottawa	A. E. James, Ottawa.
Central N. Y. Vet. Med. Ass'n....	June and Nov...	Syracuse	W. B Switzer, Oswego.
Chicago Veterinary Society.....	2d Tues. ea. mo	Chicago	D. M. Campbell Chicago.
Colorado State V. M. Ass'n.....	Jan., 1913	Denver	B. F. Kaupp, Ft. Collins.
Connecticut V. M. Ass'n.....	Feb. 4, 1913.....	Hartford	B. K. Dow, Willimantic.
Delaware State Vet. Society.....	Jan.Apl.Jy.Oct.	Wilmington ..	A. S. Houchin, Newark, Del.
Essex Co.(N. J.) V. M. A.....	3d Mon. ea. mo.	Newark, N. J.	J. F. Carey,East Orange,N.J.
Genesee Valley V. M. Ass'n.....	.....	.....	J. H. Taylor, Henrietta.
Georgia State V. M. A.....	....	Atlanta.....	P. F. Bahnsen, Americus.
V. M. A. of Geo. Wash. Un'y.....	2d Sat. ea. mo..	Wash., D. C..	A. T. Ayers.
Hamilton Co. (Ohio) V. A.....	.....	.....	Louis P. Cook, Cincinnati.
Idaho Ass'n of Vet. Graduates....	.....	Boise.....	G. E. Noble, Boise.
Illinois State V. M. Ass'n.....	Dec. 5-6. 1912...	Chicago	L. A. Merillat, Chicago.
Indiana Veterinary Association..	Jan. 15-16, 1913..	Indianapolis ..	A. F. Nelson, Lebanon.
Iowa Veterinary Ass'n.....	Nov., 12-13-14 '12	Ames..... ..	C. H. Stange, Ames.
Kansas State V. M. Ass'n...	January 7-8, 1913	Topeka.	J. H. Burt, Manhattan.
Kentucky V. M. Ass'n.....	Oct. & Feb.ea.yr.	Lexington	Robert Graham, Lexington.
Keystone V. M. Ass'n.....	.....	.....	E. H. Yunker, Phila.
Lake Erie V M. Association.....	Oct 8-12, 1912...	Lorain, O.....	Phil. H. Fulstow, Norwalk,O.
Louisiana State V. M. Ass'n.....	.....	.....	E. P. Flower, Baton Rouge.
Maine Vet. Med. Ass'n	Jan., 1913.....	Augusta	C. W. Watson, Brunswick.
Maryland State Vet. Society.....	.....	Baltimore.....	H. H. Counselman, Sec'y.
Massachusetts Vet. Ass'n.....	4th Wed. ea. mo.	Young'sBost'n	J. H. Seale, Salem.
Michigan State V. M. Ass'n.....	Feb. 4-5, 1913...	Lansing	W. A. Ewalt, Mt Clemens.
Minnesota State V. M. Ass'n.....	July 10-11, 1912.	Minneapolis...	G. Ed. Leech, Winona.
Mississippi State V. M. Ass'n....	.....	.....	Wm. P. Ferguson, Grenada.
Missouri Valley V. Ass'n.....	Jan. 21-22-23, '13.	Kansas City..	Hal. C. Simpson, Denison, Ia.
Missouri Vet. Med. Ass'n	July, 1913.....	Kirksville	S. Stewart, Kansas City.
Montana State V. M. A.....	Jan. 1913.....	Bozeman	A. D. Knowles, Livingston.
Nebraska V. M. Ass'n.....	January, 1912....	Lincoln.....	W. H. Tuck,Weeping Water.
New York S. V. M. Soc'y.....	1st wk.Sept.,1913	New York.	H. J. Milks. Ithaca, N. Y.
North Carolina V. M. Ass'n.....	June, 1913.	Salisbury.. ..	M. J. Ragland, Salisbury.
North Dakota V. M. Ass'n.....	Jan., 22-23, 1913.	Fargo.....	C.H.Babcock,New Rockford
North-Western Ohio V. M. A.....	Feb and Nov...	Lima.	A. J. Kline, Wauseon.
Ohio State V. M. Ass'n.....	Jan. 8-9, 1913.....	Columbus.....	Reuben Hilty, Toledo.
Ohio Soc. of Comparative Med..	Annually	Up'r Sandusky	F. F. Sheets, Van Wert, Ohio.
Ohio Valley Vet. Med. Ass'n.....	.....	.....	J. C. Howard, Sullivan.
Oklahoma V. M. Ass'n.....	Dec. 14-15, 1911.	Okla. City....	C. E. Steel, Oklahoma City.
Ontario Vet. Ass'n.....	April, 1912.....	Toronto	C. H. Sweetapple. Toronto.
Pennsylvania State V. M. A.....	Jan. 21-22, 1913..	Harrisburg ...	John Reichel, Glenolden.
Philippine V. M. A.....	Call of President	Manila.....	David C. Kretzer, Manila.
Portland Vet. Med. Ass'n.....	4th Tues. ea. mo.	Portland, Ore	Sam. B. Foster, Portland,Ore
Province of Quebec V. M. A.....	.....	Mon. and Que.	Gustave Boyer, Rigaud, P. Q.
Rhode Island V. M. Ass'n.....	Jan. and June..	Providence ...	J. S. Pollard, Providence.
South Carolina Ass'n of Veter'ns	.....	.....	Clarence E. Smith, Greenville.
So. Illinois V. M. and Surg. A....	Jan. 2-3, 1912...	Centralia	F. Hockman, Iola.
St. Louis Soc. of Vet. Inspectors.	1st Wed. fol. the 2d Sun. ea. mo.	St. Louis.....	Wm. T. Conway, St. Louis, Mo.
Schuylkill Valley V. M. A.....	Dec. 18, 1912....	Reading ..	W. G. Huyett, Wernersville.
Soc. Vet. Alumni Univ. Penn.....	.....	Philadelphia..	B.T.Woodward,Wash'n,D.C.
South Dakota V. M. A.....	July 8-9, 1913....	Mitchell	S. W. Allen, Watertown.
Southern Auxiliary of California State V. M Ass'n.....	Jan.Apl.Jy.Oct.	Los Angeles..	J. A. Dell, Los Angeles.
So. St. Joseph Ass'n of Vet. Insp..	4th Tues. ea. mo.	407 Ill. Ave....	H. R. Collins, So. St. Joseph
Tennessee Vet. Med. Ass'n.....	November, 1913.	Memphis.....	O.L.McMahon,Columbia.
Texas V. M. Ass'n.....	Mar. 18 19, 1912..	Fort Worth...	R. P. Marsteller, College Sta.
Twin City V. M. Ass'n....	2d Thu. ea. mo .	St.P.-Minneap	S. H. Ward, St. Paul, Minn.
Utah Vet. Med. Ass'n.....	Mar., 1912	Logan	A. J. Webb, Layton.
Vermont Vet. Med. Ass'n	....	....	G. T. Stevenson, Burlington.
Veterinary Ass'n of Alberta.....	.....	.....	C. H. H. Sweetapple, For.
Vet. Ass'n Dist. of Columbia.....	3d Wed. ea. mo..	514—9th St., N. W.....	Saskatchewan, Alta., Can. M. Page Smith, Wash., D.C.
Vet. Ass'n of Manitoba.....	Midsummer Fair	Winnipeg.....	F. Torrance, Winnipeg.
Vet. Med. Ass'n of N. J.....	Jan., 1913	Jersey City...	E. L Loblein,New Brunswick.
V. M. Ass'n, New York City.....	1st Wed. ea. mo.	141 W. 54th St.	R. S. MacKellar, N. Y. City.
Veterinary Practitioners' Club....	Monthly	Jersey City ...	A. F. Mount, Jersey City.
Virginia State V. M. Ass'n	July 10, 1913.....	Old Pt. Comf't	Geo. C. Faville, No.Emporia.
Washington State Col. V. M. A ..	1st & 3d Fri. Eve.	Pullman.....	R. J. Donohue, Pullman.
Washington State V. M. A.....	Jan 9-10, 1913...	Wenatchee....	Carl Cozier, Bellingham
Western Penn. V. M. Ass'n.....	3d Thurs.ea.mo.	Pittsburgh....	Benjamin Gunner, Sewickley.
Wisconsin Soc. Vet. Grad	July, 1912.....	Janesville.....	J. P. West, Madison.
York Co. (Pa.) V. M. A...	Quarterly.....	York	E. S. Bausticker. York. Pa.

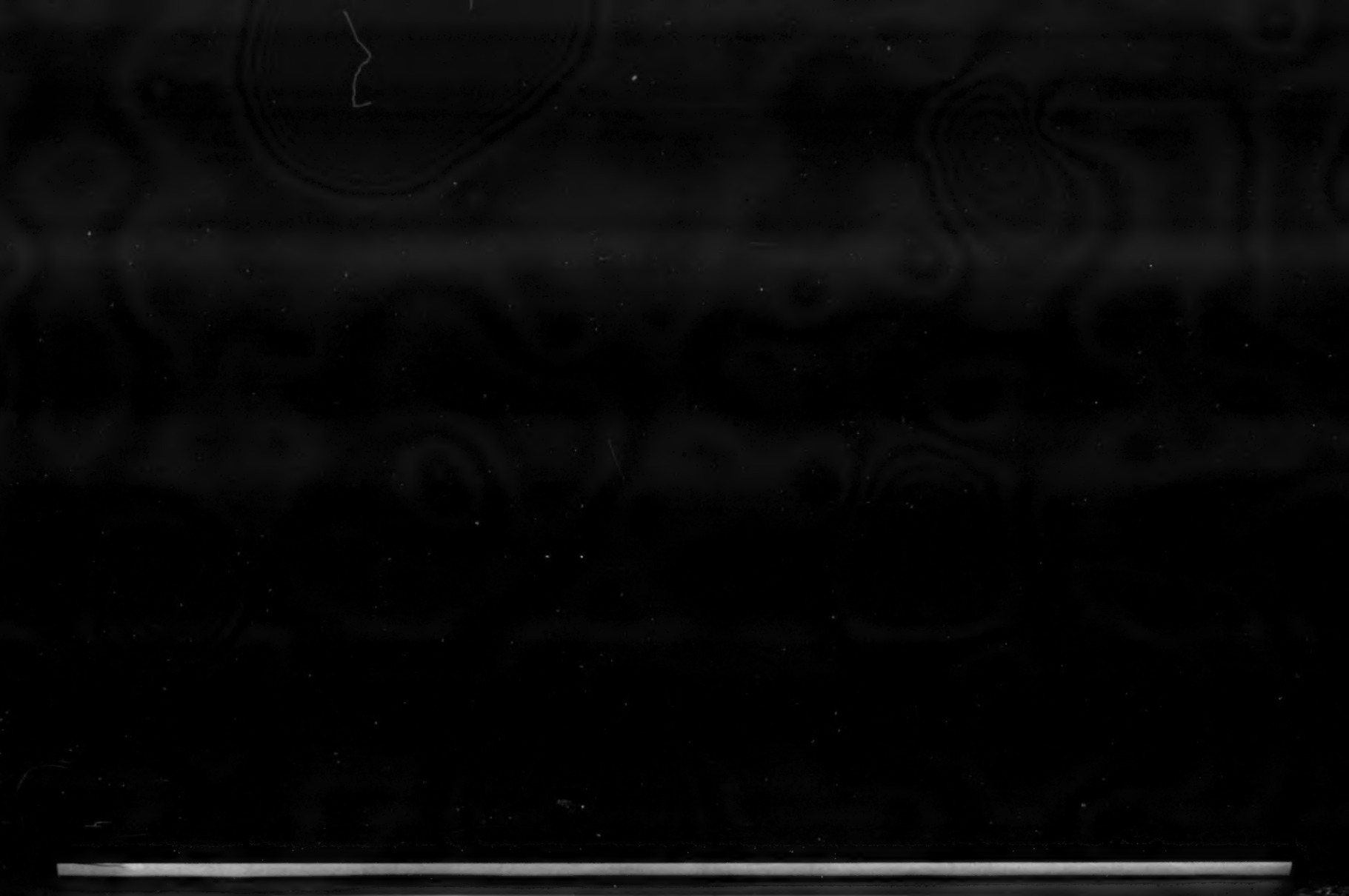
PUBLISHERS' DEPARTMENT.

Subscription price, $3 per annum, invariably in advance; Canadian subscriptions, $3.25; foreign countries, $3.60; students while attending college, $2; Students in Canada, $2.25; single copies, 30 cents in U. S. **Copy for advertisements should be received by 10th of month.**

Rejected manuscripts will not be returned unless postage is forwarded.

Subscribers are earnestly requested to notify the Business Manager immediately upon changing their address. **Make all checks or P. O. orders payable to American Veterinary Review.**

As Spring Approaches, green stock becomes disseminated throughout the country and "shipping fever" troubles begin. See the announcement of the Beebe Biological Laboratories on page 13 (adv. dept.) and get posted on Anti-Influenza Vaccine. Mention the Review in writing.

Chinasol, the Intense Antiseptic, is one of the most reliable, economical, satisfying and convenient antiseptics on the market. In tablet form it is always with you, and you can make any quantity of antiseptic solution you require at a moment's notice. The powder is excellent to form a surface on a large wound—and, mixed with glycerine, makes an excellent application for skin troubles in dogs. Write the Parmele Pharmacal Co., whose address you will find on the upper part of the inside back cover page. Mention the Review in writing.

Many a Man's Reputation has pivoted on his success or failure in the treatment of a case of impaction in a valuable horse so that he cannot afford to be without any appliance that will make him more successful in the treatment of that class of cases. Turn to page 6 (adv. dept.) and see Sharp & Smith's Rectum Lock Syringe there illustrated and described, and then get in communication with that firm without delay, as you ought to have this appliance. Be sure to mention having seen it in the American Veterinary Review.